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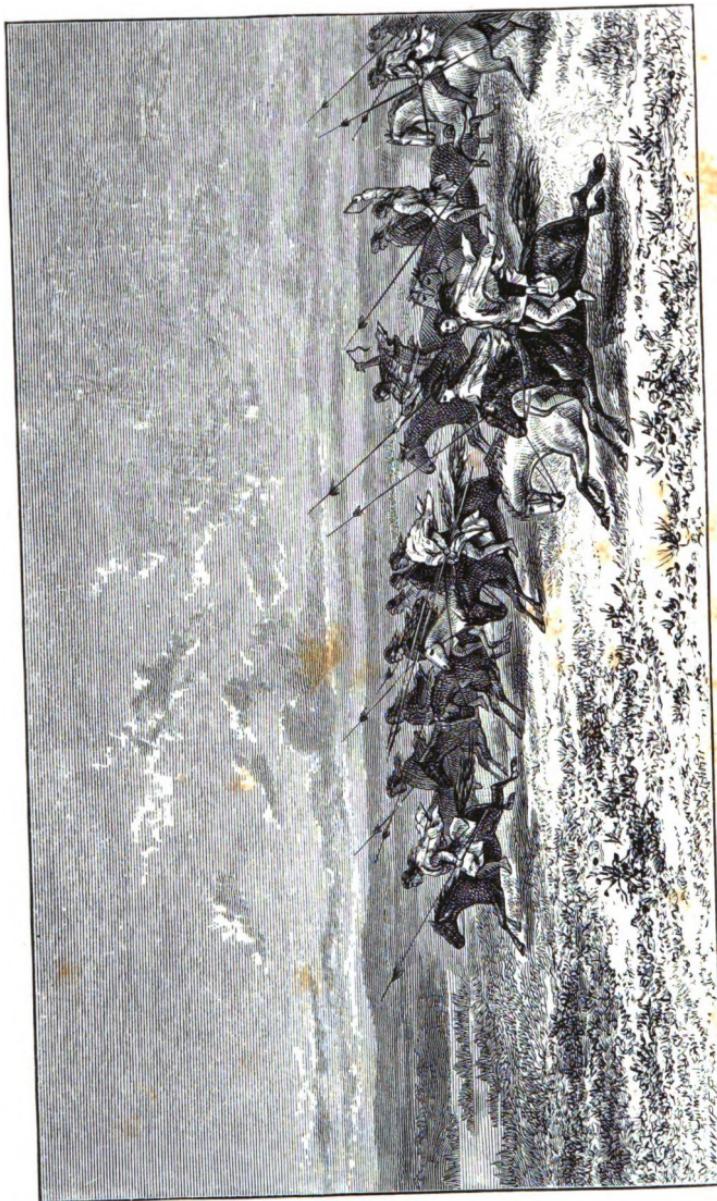


Across the Pampas and the Andes

Robert Crawford

ACROSS THE PAMPAS
AND
THE ANDES.

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AN INDIAN INVASION.

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ACROSS THE PAMPAS AND THE ANDES.

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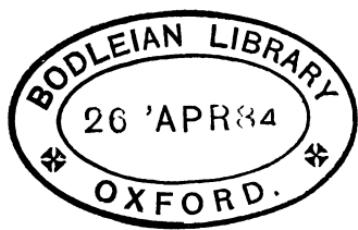
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ETC. ETC.

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PREFACE.

As a careful reader naturally turns to the preface of a book for a forecast of what is to be found in its subsequent pages, it is the duty of an author to give at starting an outline of his work, which will convey a general idea of its contents.

I shall therefore now endeavour to discharge my obligation in this respect by presenting, in the most compact form I can, a sketch of the origin of this volume, and the travels to which it relates, merely transposing the order in which I have mentioned them.

Messrs. Waring Brothers of London having entered into an agreement with the Government of Buenos Ayres to send out a staff of engineers to explore and survey the route for the proposed Trans-andine Railway, I had the honour to be appointed Engineer-in-Chief of the expedition, and, accompanied by the other members of the staff, at

once proceeded to the River Plate to carry out the engagement.

Upon arriving at Monte Video, we found that yellow fever was raging at Buenos Ayres to so great an extent that no public business could be transacted.

In addition to this, the original popularity of the Transandine scheme, which it enjoyed at the time of its first proposal, was decidedly on the wane. Some little friction appeared to have arisen between the National and Provincial Governments on the subject, and a general feeling seemed to prevail, that the undertaking was one of vastly greater magnitude and responsibility than had been supposed when it was first broached.

Under these circumstances the Provincial Government, for whose account the expedition was to be undertaken, was beset with perplexities and embarrassments, which caused considerable delay at first; but the unexpected obstacles which had thus arisen were at last removed, and the party started on the journey.

During the progress of the explorations, I kept a careful diary, and, as has always been my habit when travelling in strange countries, made numerous sketches and notes of such objects as attracted my attention.

With this diary for a basis, the volume which I

now lay before the reader has been written as a short account of a journey across the continent of South America under circumstances of considerable interest. A few of my rough sketches have been selected to illustrate it, but all the credit that belongs to them is due to the very effective manner in which they have been treated by that excellent artist, Mr. Whymper.

One of the illustrations ("Monte Video during the Yellow Fever"), as I have mentioned where it occurs in the book, is from a photograph by Messrs. Bate, I believe, of Monte Video; but I should add that "An Invasion of Indians" is also from a photograph, taken, I think, from a sketch by the well-known French artist, Mons. Pallière.

So much for the plot and contents of the body of the volume; and now a few words as to how it, with its Appendix, came to be written and published.

After the completion of the surveys for the Trans-andine Railway, and the return of the expeditionary party to their headquarters in the River Plate, having been pressed by the English chaplain at Monte Video to give a public lecture at an entertainment he was getting up for the benefit of some schools there, I chose for my subject our then recent travels.

Some friends, possibly more complimentary than wise, tried to prevail on me to publish the lecture, but I had strength of mind enough at the time to

refuse to do so. The poison of that most insidious of moral diseases, the *cacoethes scribendi*, had, however, been caught, and developed shortly afterwards, with the result that I set to work upon my lecture, curtailing it in some places and enlarging it in others, until it had considerably increased in size.

But it was only last autumn that I took the matter seriously in hand with a view to publication.

I had then to recast a great deal of my work so as to bring the information down to the present time. I was also strongly urged to enlarge its scope, and to utilise my intimate knowledge of the country, acquired during a residence there of two periods of three years each, in charge of various public works, by adding an Appendix on the Argentine Railways and Colonies. In compliance with this advice, I have carefully brought together a considerable amount of information about the Railways; but as regards the Colonies I have only been able to deal with them superficially, for although I was at one time very well acquainted with the position and details of the colonies of Santa Fé, having inspected and reported upon several of them, still these settlements are of such rapid growth that to speak with certainty concerning them one would require to have visited the locality recently.

Articles upon the Peaks and Passes of the Andes, which may interest travellers and geographers, are

given in the Appendix, as also one on the Indian frontiers and invasions, showing, by extracts from the newspapers of the day, the deplorable condition of the settlers in exposed parts of the country at the time, which became so unbearable that shortly afterwards a war was undertaken against the Indians, who were driven southwards from the Pampas into Patagonia, and a new and more secure line of frontier established.

In compiling the Appendix, I have supplemented my own personal knowledge by seeking for information from many sources, which it is my duty to acknowledge.

To Mr. M. G. Mulhall I am indebted, not only for the recent information concerning the Argentine Railways referred to where the subject is treated of, but also for what I have found in his invaluable "Handbook of the River Plate Republics," with which his brother's (Mr. E. T. Mulhall's) name is associated as joint-author, and in their paper, the *Buenos Ayres Standard*, too, a very favourite journal with all who know and take an interest in La Plata.

From Monsieur Martin de Moussy's splendid work upon the Argentine Confederation I have also levied contributions, and on Señor Rossetti's report upon the proposed Transandine Railway, although I have not always been able to agree with these

authorities as to the correctness of their geographical information.

Darwin's delightful book, "A Naturalist's Voyage Round the World," I have frequently quoted from, mentioning the fact on each occasion that I did so.

I must not conclude without acknowledging the great assistance I received from my friends, Messrs. Gravell and Logan, in the preparation of the plan showing the route we travelled by.

And I gladly avail myself of the opportunity to record my grateful remembrance of the kind consideration and willing assistance I ever received from my colleagues upon the Transandine Expedition, who, not only in the discharge of their difficult and frequently dangerous duties, but in the manner they bore both hardships and privations, always exhibited a spirit of self-denial, courage, and devotion deserving of the highest praise.

R. CRAWFORD.

TRINITY COLLEGE, DUBLIN,
March 1884.

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ACROSS THE PAMPAS AND THE ANDES.

CHAPTER I.

THE VOYAGE OUT.

UPON a bleak and cheerless day in the month of March 1871,—a day rendered still more dismal by the drifting rain which fell in fitful showers,—we left Liverpool, a party of civil engineers, in the steamer *Atacama*, bound for the River Plate, the object of our mission being to explore and survey the route for a proposed railway across the continent of South America from Buenos Ayres to Chili, which would connect the Atlantic and Pacific Oceans by an iron link similar to that binding together New York and San Francisco, or the chain now being forged by our Canadian fellow-subjects farther north, to stretch from one coast to the other of their vast Dominion.



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Many circumstances combined to add interest to the expedition ; nor were the elements of novelty and the possibility of adventure wanting among the attractions which presented themselves as inducements to join it.

A large extent of the country to be travelled through was the hunting-ground of the Pampas Indians, and, for the most part, unknown to white men,—a circumstance which is by no means surprising, considering the disturbed state of the frontiers, and the perpetual invasions to which they were exposed.

We were to see the mighty Andes, too, and to explore the valleys of that far-famed mountain range, not upon the beaten paths by which communication is kept up, but in places rarely trodden by the foot of man ; and who could tell what wonders might be met with in those secluded spots !

But there was not much opportunity for fanciful speculations of this kind, as they were soon obliged to give place to the prosaic preparations for a long sea-voyage, the arrangements for which had to be compressed into a marvellously short space of time, so that we had scarcely leisure to realise our position till we found ourselves on board the “tender,” as she puffed along vigorously towards the ocean steamer, which lay awaiting us in the

Mersey near the Birkenhead side of the river, with thick black smoke issuing from her funnel, accompanied by a hissing noise of escaping steam, as if indicating her impatience to be off.

Upon a close inspection of what was to be our floating home for the ensuing month, trim and neat though she looked, it was impossible to resist the misgiving that she exhibited an amount of "top-hamper," suggestive to old travellers of heavy rolling in a rough sea; and our inquiries elicited the fact that the ship was not built or intended for Atlantic passages, but for local trade in the Pacific between the ports on the northern coast of Chili and those of Peru, where stormy weather or rough seas are almost unknown.

However satisfactory this explanation might be to the fortunate inhabitants of those favoured regions of calms, it was not equally reassuring to us as to what her conduct might be in a gale in the Bay of Biscay, or when exposed to a "pampero" off the River Plate; but, as we had taken passages by this steamer, and the time at our disposal did not admit of our waiting for the sailing of the next one, we had to make the best of our position, and to settle down to the selection of cabins and berths, which occupied our attention until the ship had left her moorings and was moving slowly down the river, when we had

leisure to devote to an investigation of our fellow-passengers, and to form conjectures as to their probable development into agreeable companions or otherwise, under the combined influences of sea-sickness and the imprisonment of life on ship-board.

We were soon over the bar and off to sea, fairly started on our voyage, the weather continuing severe and cold till our arrival, on the third day out, in the river Gironde, up which we steamed to Pauillac, about thirty miles below Bordeaux. The night previously one of our fellow-passengers died. He was a poor old invalid returning to leave his bones in his beloved France, of which he was a native.

After a delay of thirty-six hours, caused by fogs, the ship resumed her voyage, and reached the port of Santander, in the north of Spain, on the following morning.

The rain and mists had disappeared, and the sun shone brightly upon the beautiful mountains which form the background to the harbour.

After overcoming some difficulties regarding the quarantine regulations, we were allowed to embark a number of Basques—intending emigrants to the River Plate—and to proceed on our course.

Next day we passed Cape Finisterre, and in twenty-four hours arrived at Lisbon. Here the

passengers were permitted to land, most of them taking advantage of the opportunity to stretch their legs on shore, getting off afterwards to the ship in good time to leave Lisbon harbour the same evening.

Shortly after losing sight of the land we experienced heavy squalls, which gave proof of the correctness of our first impressions as to the sea-going qualities of the steamer. She rolled about and rocked and creaked, till we were fairly at our wits' end to devise some means of placing ourselves in a recumbent position which it was possible to retain. There are few persons with minds so constituted as to enjoy all the vicissitudes of life, and I think the number is equally limited that would feel an agreeable sensation in being jerked out of a top berth and deposited unceremoniously upon a miscellaneous assortment of crockery and glass-ware, the remains of what had originally been the "cabin fittings," but which, in consequence of the ship's rolling, had wandered about the floor in the most erratic manner. To avoid such an undesirable contingency, some of us adopted the expedient of strapping ourselves to the nettings over the beds—a plan the inconveniences of which were more than counterbalanced by the security it imparted.

During calm weather life on board was somewhat monotonous for the passengers, who, unlike the

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officers and crew, had no fixed duties to discharge. Breakfast, luncheon, dinner, and supper, which were the events of the day, were, however, attended with the most conscientious regularity. Under such circumstances it is not surprising that the most trivial incidents occupied much of our attention. How gladly we hailed the advent of the rollicking porpoises whenever they came alongside as if to run races with the ship ! And when their visits were paid to us after dark, the interest they aroused was all the greater in consequence of the phosphorescent light that marked their course through the waves as they flashed along like submarine meteors.

A sad accident occurred one stormy night. A sailor fell from the rigging to the deck, and was killed on the spot. The poor fellow's death was sad and sudden.

Next day the funeral took place. The body, bound up in a hammock, and properly weighted to sink it, was brought on deck and placed upon a gangway of planks, with their outer ends slightly projecting over the ship's side. His country's flag covered his remains, over which the captain read the impressive service for the burial of the dead at sea. This done, the inner end of the gangway was gently lifted up and the body slid off, and, with a plunge into the seething waves below, was committed to the deep, there to rest in the sailors'

burial-ground, where many a brave man had gone before him. And as soldiers returning from a comrade's funeral have their spirits kept up by the strains of lively music, so in this case, to effect the same object, grog was served out to the crew, in which their temporary gloom was washed away, until soon there was no more trace of it left than of the ship's track on the rolling sea.

Poor Jack's effects were disposed of by auction next day, the purser managing the sale, as is customary on such occasions. His goods and chattels were but few and of little value; but scanty as they were, no doubt he carried about with him, concealed beneath his well-worn sailor's jacket, a manly and courageous heart that made his hard lot light to bear, and that beat as warmly in affection and love as those of the more favoured sons of fortune.

We passed Teneriffe upon the tenth day out; but the sky being cloudy and unpropitious, we were only so far favoured as to catch for a short time a glimpse of the "Peak," with its lofty summit covered with what looked like snow.

Three days afterwards we steamed into the harbour of San Vincent. As we approached the anchorage, a boat in the act of being lowered over the ship's side at the time, with two of the crew in it, got swamped by some accident, causing for the

moment considerable excitement as to the fate of the men. Fortunately the boat was made fast securely, and the only injury the men sustained was a thorough ducking, coupled with an unpleasant dragging through the water till the motion of the steamer could be stopped.

At San Vincent the parched and burnt-up look of the scanty vegetation that meets the eye on every side and the miserable condition of the inhabitants have a most depressing effect upon the traveller, who, if he be wise, will stop on board, instead of making any investigations on shore, and content himself with watching the expertness of the host of diving boys who swarm around the ship, and clamour in doubtful English for an opportunity of exhibiting their aquatic feats, in overtaking the slowly sinking silver coins which they vehemently urge the spectators on deck to throw into the water. It was amusing to watch the pursuit, and to see the successful diver upon his return to the surface thrusting the captured piece of money into his mouth, which he uses for a purse, after the manner of the monkeys at the Zoological Gardens when too liberally supplied with nuts for their immediate wants,—a similarity of habit to which, as far as I know, the attention of naturalists has not been previously directed. There is, moreover, an element of excitement in these sports which keeps the atten-

tion of the beholders from flagging, as the bay abounds with sharks, and one can never tell when a finny depredator of this kind may be seized with the desire to taste human black bait.

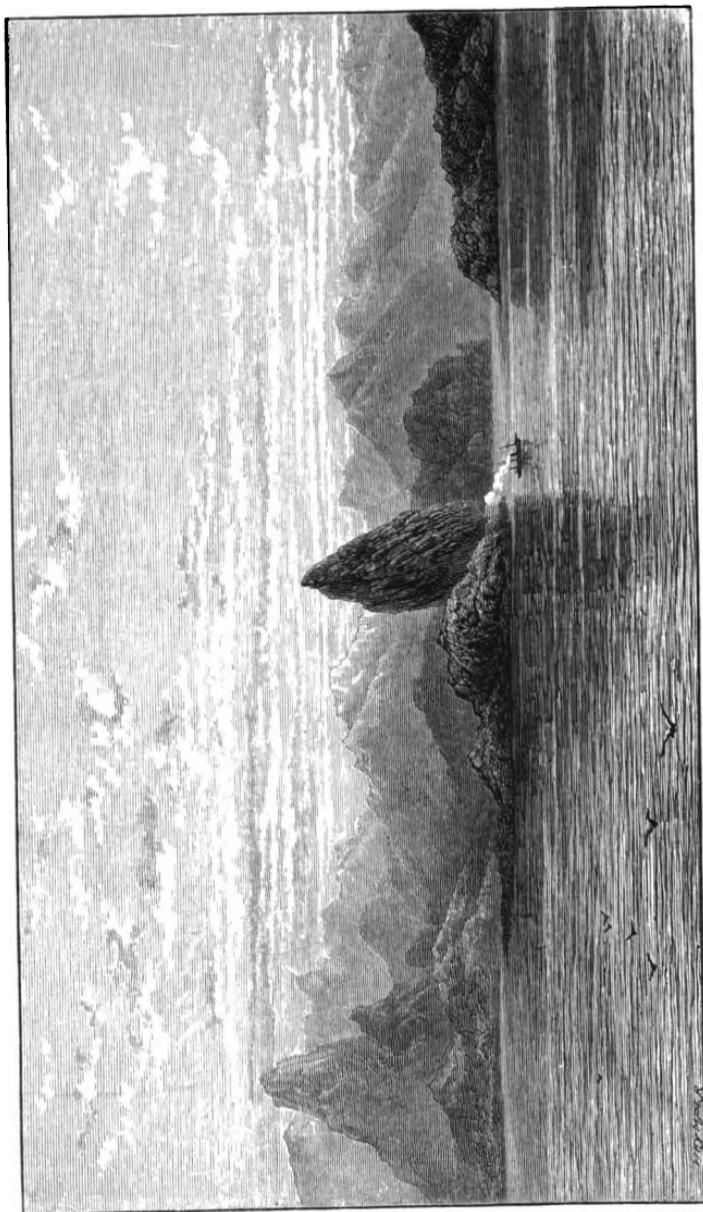
That the negroes are not unaware of the existence of such a contingency I myself had proof in the same harbour on another occasion, when under similar circumstances a shark was observed swimming slowly round the ship, with his back fin above the surface of the clear water. No sooner was his magic name pronounced, than a general rush on the part of the divers was made for the boats, where from a safe retreat they watched the movements of their common enemy, the interrupter of the gathering of their silver harvest, and followed him with maledictions which, if he understood their language, must have made his cold blood curdle; and that same evening they had their revenge, for we captured the shark, and with many a cheer of delight did the dusky divers greet his floundering attempts to resist the power of the steam-winch by which he was hoisted up on board, after the sailors had passed a noose of strong rope round his body.

To resume my narrative. We left San Vincent after a few hours' delay, and with a sense of the most intense relief did we welcome the change from the roasting we had undergone during the coaling of the steamer to the pleasant breeze which greeted

us as we passed out to sea. The curiously-shaped island at the entrance to the bay, the resort of innumerable seabirds, and the mountain in the distance, so dear to North Americans in consequence of its outline bearing a fancied resemblance to the profile of Washington, failed to elicit a spark of enthusiasm among us, so prostrate were we after six hours' contemplation of that arid shore, and it was not until we had lost sight of land that our minds were restored to a perfectly healthy tone.

At this part of the voyage we began to meet with our little friends the "flying-fish" in great numbers. Our next introduction was to the beautiful nautilus. He too aspires to add the quality of a denizen of another element to his character of a fish. There is no hurry or confusion about his movements as he floats along upon the surface of the waves in his fairy bark radiant with prismatic colours.

Our course was now directed across the Atlantic towards the Brazilian coast, and as we approached the equator we experienced some of the disagreeable meteorological changes for which that locality is celebrated. Fogs so thick that one could scarcely see a ship's length ahead, were followed by glaring sunshine falling vertically on the deck, causing the tar in the caulking of its seams to ooze out to an extent that made walking on the sticky substance anything but pleasant. Then a squall, as sudden



ENTRANCE TO RIO HARBOUR.

as it was angry, came down upon us, lashing the waves to fury as it travelled along, and blowing off their crests in white spray, like that of billows breaking on the seashore. This in its turn made way for a dead calm which ushered in a deluge of rain from the dull leaden-coloured clouds, confining the passengers to the close and suffocating cabins till the utmost limits of endurance were almost exhausted. Such is life on shipboard in the tropics, but fortunately steam reduces these discomforts to a minimum by shortening their duration.

It was after passing through experiences of the kind I have described during a run of eleven days from San Vincent that we found ourselves entering the magnificent harbour of Rio de Janeiro, which for extent and the height and boldness of the mountains surrounding it, as also the beauty and luxuriance of the tropical vegetation along the margin of the bay and the islands which dot its surface, may well claim to be almost, if not altogether, without a rival. To the left of the entrance, which is about a mile in width, a conical peak called the "Sugar Loaf" rises abruptly to a height of about a thousand feet from the water's edge, forming a landmark that, when once seen, can never be forgotten or mistaken for any other, and safely guides the mariner to the commodious harbour, of which at a distance there is no external sign.

The city itself lies on the left or west side of the bay, about four miles from the entrance, but its suburbs reach much closer. The irregular nature of the ground on which it is built gives an imposing effect to the general appearance Rio presents.

The day of our arrival the rain fell in heavy torrents, preventing our fully enjoying the lovely scenery around us; but the following morning made amends for its predecessor's ill-humour by such brilliancy as is only to be met with in the tropics. We went ashore early and did much sight-seeing, visiting among other places the botanical gardens, where the most luxuriant vegetation, producing strange contrasts and combinations of colour, glowing and bright, met the eye on every side, so that I turned with a sensation almost of relief to gaze upon the more sombre grey of the mountain looking down in stately grandeur upon the gardens at its base. The principal feature usually attracting attention to this lovely spot is its celebrated avenue of palm-trees of marvellous extent, size, and regularity; but I must confess that it was the beauty of its natural position that pleased me most.

There was but one drawback to the pleasure of our three days' stay at Rio—we there heard the confirmation of a rumour which had reached us at Lisbon, that yellow fever had broken out in a very malignant form at Buenos Ayres—the starting-

point of our expedition—so that we resumed our voyage rather dispirited by the gloomy news we had heard.

As we approached the mouth of the river Plate rough and stormy weather was experienced, such as is not uncommon off the South American coast. A “pampero” (as a gale from the south-west is here called on account of its direction being across the “pampas”) is the terror of mariners in these seas. It seems to gain strength as it travels across the vast plains, unbroken by any inequalities on the surface of the ground, until it can restrain its violence no longer, and rages with unexampled force, scattering ruin and destruction on all sides, uprooting trees, unroofing houses, and prematurely terminating the voyaging of many a good vessel that had weathered the roughest storms in other regions.

At last we reached Monte Video, the port at which we were to disembark, after having spent exactly a month on board the *Atacama*; and, having said good-bye to Captain Shannon and the officers of the ship, to whose nautical skill and kindly bearing we were greatly indebted for the security and comfort of our trip, and wished them a pleasant and prosperous continuation of their voyage to Chili, whither they were bound, we went on shore, not sorry to change the rolling motion of the ship for the more secure footing of *terra firma*.

CHAPTER II.

MONTE VIDEO, RIVER URUGUAY, AND ENTRE RIOS.

UPON landing at Monte Video we ascertained that matters in Buenos Ayres were in a desperate condition, much worse even than the sensational account which we had heard at Rio would have led us to expect. Yellow fever was raging there with the fury of a plague. Seven hundred and fifty deaths from it had been registered in a single day, and public report placed the actual number of victims considerably higher.

All regular communication between the two ports (only a hundred miles apart) was stopped. The Government at Buenos Ayres, having proclaimed public holidays, had migrated from the infected city, while business of all kinds remained suspended. Under these circumstances all that could be done was to call upon the Argentine Consul at Monte Video, and request him to report our arrival to his Government and await instructions. The

reply received by telegram was, "Ask Crawford if he is willing to come during the epidemic—letters to-morrow." To this question an affirmative answer was returned, and a number of suggestions were made and communicated in writing to the Argentine Consul at Monte Video, to be forwarded to the Government at Buenos Ayres for its guidance, and to facilitate the completion of the preliminary arrangements for starting the expedition, so as to avoid the extra risk to the staff by unnecessary detention upon their arrival in the infected city. It was also suggested that, instead of the members of the staff going direct to Buenos Ayres, it might be well for them to land at the port of the "Tigre," about eighteen or twenty miles higher up the river, and then to cross the country to some town on the Western Railway in direct communication with Buenos Ayres, a suggestion which it was supposed would be the more suitable and convenient as it was understood, at Monte Video, it was in that direction the members of the Government themselves had gone; moreover, it was from the end of the Western Railway that the Transandine expedition was to start.

Various meetings with the Consul at Monte Video followed, at which we heard that preparations were being made at Buenos Ayres; but no further action in the matter was taken at the time, and we had

therefore to wait till the Government should direct us what to do.

Our enforced sojourn at Monte Video was not at the most agreeable or opportune moment, in consequence of that city being then in a state of siege, and daily expecting to be attacked by a revolutionary army.

Some sharp fighting must have taken place in the suburbs previous to our arrival, judging from the number of bullet-marks upon the houses and the shattered condition of the windows. Trenches were cut across the streets at the entrance to the town, and the paving-stones heaped up to form barricades, at which temporary forts were erected with guns mounted upon them so as to command the approaches from the country. The general topic of conversation when friends met was naturally the war and its possible consequences in the event of the rebels taking the city by storm, a contingency which I was surprised to find many persons considered to be by no means improbable.

Although civil wars in the River Plate are not usually sanguinary, nor is the ordinary soldier a sufficiently experienced marksman to bear comparison with the competitors for prizes at the Wimbledon meetings, still volleys fired at random into an inhabited city might do harm, nor could one contemplate the entrance of infuriated and

undisciplined troops into it without a shudder. Fortunately the result was not so bad as had been feared, as not long after our arrival a peace was patched up; not a very lasting one, as it proved, but still better than an actual state of civil war, at least so far as the dwellers in cities were concerned, although it had its disadvantages too, which were keenly felt by the inhabitants of the interior, where gangs of the disbanded "Patriots," with occupation gone, roamed at large, helping themselves to their neighbours' horses and other property when the occasion offered.

Upon the restoration of peace we had better opportunities for seeing Monte Video and the country in its rear to advantage. The city itself is the capital of the republic of Uruguay, or "Banda Oriental," as it is locally called, and lies near the entrance to the Rio de la Plata, on its left or northern bank. It is situated upon one side of a small bay, some two miles long and from one to one and a half mile wide, on the other side of which, near its outer end, is a hill (dignified by the name of "Cerro" or mountain) possessing on its top the remains of an old Spanish fort, now used as a gaol, in which the prisoners are not always too securely kept. The centre line of the promontory forming the site of the city is slightly elevated, and from it the land slopes downward on both sides to the

water's edge. The streets, with very few exceptions, are laid out at right angles to each other, and cross at regular intervals of 100 varas, about 95 yards, and for the most part are well paved with granite from the neighbouring quarries.

The number of inhabitants is estimated at one hundred thousand, and goes on steadily increasing. The houses are generally substantial, and many of the public buildings are both ornamental and imposing.

The Government Houses, however, are very unpretentious both in design and execution, and well suited to the simplicity of a country where tenure of office is so precarious. It is worthy of remark that, instead of following the principle of regularity on which the rest of Monte Video is laid out, they are built diagonally across the line of streets, so as to give them the general appearance of blocking up and obstructing the public ways in a manner that by local cynics is said to be emblematical of the spirit in which business is sometimes conducted within their walls. The hotels are good—the "Hotel Oriental" particularly so—and the shops for the most part would bear favourable comparison with those of more pretentious towns in Europe.

Monte Video possesses gasworks, and is supplied with good wholesome water brought in pipes from the river Santa Lucia, a distance of thirty-six miles.

These latter works were only in process of construction when we arrived there, but have long since been in full operation. Although carried out under the superintendence of an English engineer, Mr. Newman, the undertaking was due to the private enterprise of Messrs. Lezica, Lanus, and Fynn, natives of the River Plate, for whose account the water-works were constructed.

Tramways from the business centre of the city extend in different directions to the suburbs, affording very convenient accommodation for merchants and others, who prefer living during times of peace in the purer air of the country, but are compelled by their occupations to attend daily in town.

The Central Uruguay Railway starts from Monte Video. Although then in its infancy, it now stretches for a distance of one hundred and thirty miles into the interior, to the north bank of the river Yi, which passes Durazno, with a branch of twenty miles in length from the river Santa Lucia to the town of San José. There is also a partially constructed railway, beginning at Monte Video and projected to extend towards the east to the Brazilian boundary in various ramifications, when sufficient funds are forthcoming for accomplishing that desirable object. A short line to the slaughtering grounds, where the cattle for supplying the daily requirements of the meat-markets of the city are killed, has also to be

enumerated ; besides another line, called the North-Western Railway of Monte Video, starting from the town of Salto on the river Uruguay in the northern part of the republic, and intended to go on ultimately to Santa Rosa, near the Brazilian frontier, but as yet only opened for half that distance, or about fifty miles. These form the highways of the country as far as they are yet developed.

In its geographical position Monte Video is greatly favoured, being a port of call not only for all steamers trading between Europe and the River Plate, but also for those bound for the Pacific by the Straits of Magellan.

The roadstead admits of ships drawing twenty feet of water approaching to within a couple of miles of the shore, and farther in there is a large semicircular bay, to which reference has already been made, where numbers of smaller craft lie securely anchored.

This could easily be converted into a safe and commodious harbour, as, although it is now too shallow for that purpose in consequence of being silted up with mud and sand, dredging would soon remove this deposit and give a sufficient depth of water for all requirements. Several proposals for effecting this have been laid before the Government at various times, but as yet no comprehensive plan has been decided on, nor is it likely that any real progress

will be made in this respect for some years to come, until Uruguay shall have recovered from the effects of her repeated revolutions, and, by settling down into a steadier political life than she has hitherto followed, endeavour to retrieve the credit in financial matters which she once enjoyed. With a soil the fertility of which it would be impossible to exaggerate, and a temperate and healthy climate, all Uruguay requires to secure her prosperity is peace and a Government sufficiently strong to enforce respect for law and order, and honestly determined to meet all liabilities.

No instructions having reached us from the Government of Buenos Ayres for three weeks after our arrival at Monte Video, I arranged to go up to "Entre Rios," a province of the Argentine Confederation, contained between the rivers Parana and Uruguay, with a portion of the engineering staff, there to occupy our time while waiting for some decision to be arrived at as to the Transandine expedition, by making the surveys for a canal which it was proposed to construct at the "Salto Grande" (or Great Fall) on the Uruguay, for the purpose of improving the navigation of that river.

Before leaving Monte Video I called upon the Argentine Consul and informed him of my intended departure, introducing to him at the same time

a member of the staff who was to remain behind, and with whom he could communicate in case of instructions being sent from Buenos Ayres, so that we might at once be recalled should it become necessary.

Upon May 9th, those of us intended to make the surveys for the Salto Grande Canal left Monte Video per steamer for Concordia, a town, at that time of about 4000 inhabitants, in the province of Entre Ríos, close to the right bank of the river Uruguay, and nearly opposite the town of Salto in the Banda Oriental, the Salto Grande being about ten or twelve miles higher up.

As we passed Buenos Ayres on our way, at a distance of some ten or twelve miles off, we gazed at that city of sorrow with a painful interest, thinking what terrible havoc death was working there, while the sun shone down upon it with its cheerful rays, making all around look bright and pleasant to the eye.

In steaming up the Uruguay we saw Liebig's celebrated extract-of-beef factory at Fray Bentos, and Paysandú, since rendered famous by the establishment of M'Call, which sends to every part of the civilised world excellent and delicately flavoured ox-tongues preserved in tins.

On the 11th of May we reached Concordia, and set about making arrangements for executing the

necessary inspection of the river and the surveys for the proposed canal.

I visited the site of the latter in company with the Captain of the Port of Concordia, who supplied us with much useful information respecting the locality.

I also went over the workshops of Messrs. Hardy and Elsee at Salto, and was greatly impressed by the ingenuity displayed in every department of their very useful establishment ; there is scarcely anything in connection with blacksmith's or fitter's work, or repairs to iron vessels, that they cannot do.

Captain Elsee was about to take a small steamer belonging to his firm up the river to Uruguayana, in the Brazilian province of Rio Grande do Sul, and I gladly availed myself of the opportunity to accompany him.

We started on May 14th, and, Captain Elsee very kindly suiting his rate of steaming, both going up and coming back, to my requirements while passing that portion of the river where the navigation was bad, I was thus enabled to take a very great number of careful soundings, and to form a good idea of the nature of the bottom and the depth of water we should have to deal with.

The Salto Grande is not in reality a great fall, as its name implies, but a shoot or rapid occasioned by ledges of rocks crossing the river at this point,

where it is upwards of a mile wide, the rapidity of the current altering with every change in the height of the water, so that at times it is navigable, and can be ascended by steamers of very light draught, by a narrow channel only sixty feet wide, while at others it is quite impassable. For nine miles above the rapids the river is shallow ; it then deepens, and retains a fair depth all the way up to Uruguayana, except at one place, not far from San Gregorio, which is impassable for even craft of moderate size when the water is low.

The trip up to Uruguayana and returning occupied four days, and upon getting back to Concordia we set about making the necessary preparations to leave for Colonel Francia's estancia close to the Salto Grande, the courteous owner having kindly placed it at our disposal for the time required to make the surveys.

Accordingly upon May 19th we left Concordia to drive up by land to the estancia. The roads were very sandy, and the wheels sank deeply into them, making the carriage heavy to draw, so that the driver gladly appropriated a stray horse we met upon the way that seemed inclined to join himself to ours, and having extemporised a rude set of harness with some spare pieces carried in reserve, attached him to our team, and drove off in triumph with this new acquisition.

I was sitting on the box-seat with my gun in hand, when a black vulture came flying past, at which I fired, bringing it to the ground with a broken wing. The strange horse testified his dissatisfaction with the proceeding by the most violent plunging and kicking, that required all the driver's skill and address to overcome.

When at last he was brought to a state of rest, due, no doubt, in a great measure to exhaustion, the wounded bird occupied our attention by the strange coolness of its proceedings. Regardless alike of our presence and an injured wing, to say nothing of the noise and confusion the horse had created, instead of attempting to escape, it walked quietly up to us, as if about to demand an explanation of the treatment it had received; then mounting deliberately on the wheel of the carriage, hopped in through the open window as composedly as if it were a regular passenger about to occupy an inside seat for which it had been booked in the ordinary manner.

So offensive was the odour emitted by the unwelcome intruder, that we could with difficulty bring ourselves to approach and dislodge it; and when we had done this, the vulture took refuge under the legs of the strange horse, frightening him to such a degree that he began again his strenuous endeavours to get loose, not stopping till he suc-

ceeded in smashing the harness to pieces, and escaping from his flapping foe.

I am afraid that I was not popular that afternoon with my comrades and the driver, for my unlucky shot had entailed upon them much inconvenience and delay, so that it was late when we reached the estancia house.

Perhaps I should have described more minutely the bird that gave us all this trouble.

The black vulture of La Plata is the *Cathartes atratus* of Darwin, also known as the Gallinazo (or Iribu of Azara). Its plumage, as the name implies, is black, except the lower part of the primary wing-feathers next the quills, which is whitish. The head and upper part of the neck are bald, and the skin upon them, which hangs loosely, like an ill-fitting garment, is of steel-colour.

These vultures collect in flocks of considerable size, and may frequently be seen at early morning perched upon the boughs of some blighted or leafless tree, with their wings spread out to the first rays of the rising sun, as if worshipping that luminary.

I have often observed cormorants at the seaside standing by the edge of the receding water with similarly expanded wings, and I have no doubt that the object in both cases is to dry their feathers, the one after the heavy dew of the previous night, and

the other from the effects of the last dive in pursuit of its finny prey.

Dr. Francia's estancia house was a building of very primitive style, scarcely in keeping with the extent of the property it represented; but that is not to be wondered at, considering the frequency of rebellions and disturbances of the kind in Entre Rios formerly; as it would only have been putting extra temptation in the way of marauders to build a house worth sacking, in the neighbourhood. But if anything was wanting in the comforts and conveniences of the place itself, it was more than made up for by the civility and politeness we experienced from the persons in charge in the absence of the owner, who lived elsewhere himself.

During our stay there a ball was got up, the working men upon the estancia, with their wives, sweethearts, and neighbours, being the guests, and it certainly was a most interesting sight to me. The music was the inevitable guitar, which served to mark the time for barefooted women and Potro-booted* Gauchos, who went through the complicated figures of their favourite dances with a grace and dignity of deportment that are national characteristics.

* The Potro boots generally worn by the Gauchos are made from the skin of part of the hind-leg of a young horse, the hock forming the heel, and the lower part leaving an opening through which the toes project, enabling the stirrup to be seized between them.

One of the men—a soldier, who was on our surveying party—was dancing with a girl, evidently the belle of the ball, when I entered, and immediately volunteered to give up his place in my favour. The act of courtesy was but a slight one perhaps, but the manner in which it was done was so natural and well-bred that it set me wondering where these strange people get their very agreeable manners from—nothing cringing or deprecating in them, but natural and graceful ease, begotten apparently of perfect self-possession. It certainly can't be from running each other through with knives when they differ on political questions or have disputes at cards that this fascinating manner is acquired.

While up at the Salto Grande, I shot two small buff herons with crests or tufts upon their heads, the only ones I ever met with in the country. They were full grown, and about the size of the small white egret.

I also shot a carpincho or water-hog (*Hydrochaerus Capybara*). It was very heavy, and I am sure must have weighed close on 100 lbs., as I found it very difficult to drag for a short distance from the river's edge. The foot is divided into three toes, which, however, are joined by an elastic semi-web.

These animals abound along the margin of the river Uruguay, and, when disturbed on land, plunge

CHASED BY A BROKEN-LEGGED BULL.



into the water with a sudden noise, half bark, half grunt.

The one I killed we cooked, and tried to eat it, but, notwithstanding a strong determination to accustom ourselves to the food of the country as supplied by Nature, it was unanimously voted bad, having, as one of the party described it, a flavour partaking of the united qualities of rancid pork and cod-liver oil.

Our surveys went on satisfactorily, but there were places where difficulties of a somewhat unusual character occurred to impede their progress. One was a hill that had to be passed, the opposite sides of which were guarded each by a furious black bull with a broken leg. The first time I became aware of the existence of these duplicate guardians of the ground I could scarcely believe my senses. I had just narrowly escaped the angry charge of one of these animals by skilful dodging, which his broken limb, trailing on the ground, prevented him being able to follow, and I was beating a speedy retreat homewards, puffing and blowing as I went, when up from the long grass before me sprang another maimed bull, to my amazement and terror, and, not even waiting for preliminaries of any kind, charged me at once. He was quicker and more active than the other, and I had harder work to avoid his pressing attentions, but at last got off; for, after all, three-

legged bulls, although very wroth and wonderfully active under the circumstances—much more so than an inexperienced person might suppose—are by no means so dangerous as the real unbroken quadruped. Upon reaching the estancia I heard the explanation of my strange encounter. Cattle-marking had recently taken place, on which occasion the two bulls in question had got their legs broken—one, by the way, on the left side and the other on the right, a difference I had not observed in the excitement of the chase—under the rough treatment they received, and when released (for they never think of killing animals in that country, to put them out of pain, so long as there is a chance of their growing to have a larger hide) they had hobbled off, each to a beat for himself, avoiding entering into any companionship, for fear, no doubt, of unpleasantness that might arise from any little incompatibility of temper. The colour was accounted for by the fact that black predominated in the herd.

For the remainder of the time surveying operations went on, these two bulls constituted our veritable *bêtes noires*, taxing all our ingenuity to avoid them; and I fear the details of the ground about that particular hill are not so fully delineated on our plans as the topography of the rest of the line of the proposed canal.

Nor was our only danger of the kind confined to

this locality. Cattle in La Plata seem to be on familiar terms with men on horseback, for whom they show a certain amount of respect, none of which they apparently feel for pedestrians, if one may judge from their general line of conduct, as they seldom omit an opportunity of giving chase to any one who ventures near them on foot. While returning from work one evening, our attention was attracted by loud shouting and hallooing, and, looking in the direction it proceeded from, we observed some half-wild cattle charging down upon us at full speed with a number of Gauchos in pursuit behind. There was no tree, nor fence, nor stone, nor any other thing that we could shelter behind, and our fate seemed sealed. The Gauchos saw the danger we were in and spurred and whipped their horses wildly to our rescue, overtaking the herd just as the foremost had almost reached us, and, by a dexterous and simultaneous movement, accompanied by the most hideous and unearthly yells, succeeded in changing the direction of the cattle, so that they swept past us like a tornado in a cloud of dust, leaving us uninjured and untouched.

I should be ungrateful in the extreme did I fail to express not only my sense of admiration for the feats of the Gaucho on horseback, but also for his kindness of heart when occasion arises to stir up that feeling. I remember once when on a shooting

excursion in the southern part of the province of Buenos Ayres being taken very suddenly and seriously ill, when some Gauchos, who inhabited a rancho or hut close by which our tent was pitched, insisted upon giving up their own dwelling for me to be carried into, as affording a better chance of recovery than remaining under canvas, while they themselves slept in the open air, there not being room enough for them all in the tent.

And as to horsemanship, they are in a manner born to it, and can ride almost as soon as they can walk, just as the children, before they can do much more than crawl about the floor, practise their miniature lassoes in endeavouring to catch the household dogs and chickens on every occasion. The horses' tails are allowed to grow almost to sweep the ground, and I have seen a child not able to do more than toddle on his feet, holding on by a horse's tail, and trying to work up hand over hand by that difficult ascent, in the hope of eventually attaining to the enviable elevated position of a seat in the saddle, while the patient brute stood still, waiting for the intellect that was to guide his course to assume its proper place—a wonderful example of the victory of mind over matter.

A Gaucho can do almost anything on horseback. I have seen him pick up a small object placed upon the ground as he passes it at full gallop.

He can jump from the saddle to the ground without slackening speed ; and, if his horse falls, he prides himself in passing over the animal's head and alighting on his feet unhurt.

His seat is not a close one, or such as would do for crossing a stiff country after hounds, but it suits admirably for his own work on the open plains he has to ride over.

It is quite true, however, that Pampas horsemen do not always escape so free in falling as they would have one suppose. I have known many instances to the contrary.

An officer who was attached to our surveying party in Entre Rios—an excellent horseman, too—had such a severe fall that when picked up he appeared but a limp and boneless mass. As to ribs, he didn't seem to have a sound one in his body. The only plan that could be thought of was to rip up an old sack and swathe his body tightly in it like a mummy. This done, and then sewed up to prevent its coming loose, and with the rest of his frame attended to as best we could, he was sent in a carriage to a town where he got surgical aid ; and I was very glad to hear afterwards that he had made the journey wonderfully well, and, having quite recovered under skilful treatment, was on active service again, an example of the most broken-boned man in the Argentine army.

At Dr. Francia's estancia we witnessed the mounting of some young horses for the first time, and the general process of breaking them in as usually adopted in the River Plate countries.

It is a most primitive operation of the rough-and-ready order. The young animal selected to undergo the ordeal is lassoed, and, a head-stall having been put upon him, he is tied up short to a strong post firmly secured in the ground, and there left without food or water till he is well-nigh exhausted. Then a native saddle, or rather a series of pads and rugs, is put upon him and secured by a surcingle; next comes a strong bridle provided with a bit of a most powerful kind, having a ring attached to it passing through the mouth and under the lower jaw, and acting as a curb worked with great leverage. The horse is then freed from the stake and led about if he will go quietly; the trainer, after a turn or two, springs on to his back with great agility. An attendant mounted upon a steady horse rides up alongside, and tries by the inducement of companionship to coax him to go quietly along, which, as a rule, he seldom does just at first; and then the real struggle begins. Fair means not succeeding, the jockey drives the huge rowels of his massive spurs into the horse's flank, and is answered by a "buck" that is terrific to behold, followed by a succession of similar

desperate efforts of the frightened and infuriated animal to free himself from his unwelcome rider. Every time that he stops the attendant pushes up against him behind and bumps him along, till at last he starts off in a gallop, madly at first, "bucking" as he goes; but soon he gets blown, and finds the pace too fast to last. His merciless tormentor, however, has no notion of relaxing speed, and flogs and spurs him to increased exertions till he is almost ready to fall down. There are no fences or obstacles in the way, and, by a skilful use of the whip always on one side of the head, the horse is gradually worked round till he faces towards home, and back he comes after a couple of hours, jaded and blown, scarcely able to stagger along, his head down to the ground, with nostrils dilated, heaving flank, and quivering in every muscle, up to the post to be tied to it again, but not so close this time as before, and with a little grass thrown to him as if in mockery of his misery. Exhausted nature can stand it no longer, and in a few minutes he sinks down upon the ground and stretches himself out as if about to die, lying in that position sometimes as long as twenty-four hours without moving. When he is able to stand up, the process is repeated, but with very much less spirit on the horse's part, and after half-a-dozen lessons of the kind his education is considered finished. Of

course, in many instances the training has to be continued much longer; but very frequently horses that have not been backed half-a-dozen times are sold as "broken in."

It is not always, however, that the horse gets the worst of it; the jockey not unfrequently is the sufferer, receiving very serious injuries. One of those at Dr. Francia's I saw go up like a rocket from the arched back of the animal he bestrode, falling so heavily that it was he, and not the horse, that lay in an apparently dying state for twenty-four hours after; but he rallied, as the Gaucho always does, with his proverbial tenacity of life, which even a cat might be proud to possess.

Just as we finished the surveys for the Salto Grande Canal we heard from our colleague in Monte Video that traffic between that port and Buenos Ayres was about to be resumed, and we immediately returned to the former place in time to take the steamer for Buenos Ayres upon the 16th of June.

CHAPTER III.

BUENOS AYRES—CHIVILCOY.

WHEN we reached Buenos Ayres, distant, as has been said, one hundred miles from Monte Video, higher up and on the opposite or southern side of the river Plate, we found the city immersed in gloom; and no wonder it should be so, after the dreadful visitation it had gone through. A number of its inhabitants, variously estimated at between twenty and thirty thousand, had been swept off in the short space of a few months, leaving their bereaved friends stupefied by the calamities which had befallen them. Heartrending were the tales of suffering and of sorrow which one heard on every side.

During the worst of the time panic and confusion had reigned supreme. So great was the terror prevailing, that many persons seriously advocated the total and permanent abandonment of the city, and the building of a new one to replace it elsewhere, failing to perceive that the cause of all the terrible misfortune lay not in the situation of Buenos

Ayres, but with the carelessness of its inhabitants, and that from the accumulation of the filth and dirt of years a Nemesis had arisen to punish them for their neglect of all sanitary precautions ; nor did they realise for the moment that a sufficient water supply and a proper system of drainage were all that was necessary to restore their fine city to a condition worthy of the name given to it by its founders as indicating an especially healthy spot.*

It should be recorded that notwithstanding the general and widespread nature of the panic, for which there was in truth much cause, a number of the leading citizens enrolled themselves in a committee to watch over the public safety, and to assist in combating the unseen but dire foe raging in their midst ; and to their credit and the honour of their country, whether native or adopted, be it said that some of the noblest men that Buenos Ayres could ever boast of died at their posts, in the discharge of their self-imposed duties, like true heroes of the highest type.

To add to the confusion of the moment, business

* The authorities subsequently set about having this unsatisfactory state of matters remedied, for which purpose they employed the eminent English engineer, Mr. Bateman, to design waterworks and a drainage scheme for the city. Unfortunately, innumerable obstacles seem to have prevented the completion of these useful works, which it is to be hoped may be speedily brought to a successful termination.

confidence was at an end, and trade completely paralysed.

Of the total population numbering 200,000 souls, little more than one-third had remained in the city through all the time, the rest fled to districts where the terrible malady had not appeared. So great was the demand for sleeping accommodation in the country, that the most wretched huts were rented at sums that, if mentioned, would appear incredible.

A curious case of adapting oneself to circumstances under these trying conditions was mentioned to me by the general manager of one of the railways there. He, and his wife and children, lived for a considerable time in a couple of covered goods waggons belonging to the railway, which were left upon a siding at some station suitable for his purpose. When tired of one place, he had his movable houses coupled on to the next train that passed by, and ran them up or down the line with their inmates to another locality; a very convenient arrangement, by which he and his family were enabled to have change of air and scene without the trouble usually incurred in moving an entire household.

Numerous houses had the plague - spot marked upon them when we arrived, and their doors sealed up by authority, with the warning affixed that no one was to force an entrance,—a precaution seeming

scarcely necessary, considering the great risk of taking the infection such an interloper ran. It was wonderful, however, to see how soon the elasticity of the people's spirits asserted itself, and the rapidity with which Buenos Ayres regained its wonted appearance. The green, damp coating collected on the walls of vacant houses disappeared before the busy whitewash brush, and everything began to look less cheerless ; so that, except for the number of people who went about the streets in mourning, there was little left to show the depths of sorrow and confusion from which the population had so recently emerged.

Buenos Ayres is a large and well-built city, covering an extensive area. The streets, like those of Monte Video, cross each other at right angles at regular distances, in this case greater, being 150 varas, equal to 142 yards, apart ; but, with the exception of some of the principal ones, they are not nearly so well paved, owing to the difficulty of procuring stone for the purpose, as it has to be brought from Uruguay or Brazil, there being none near Buenos Ayres, or in any part of the surrounding country. The general inferiority of the street pavement has given a great impetus to tramways, which cover the whole place in an intricate network, stretching out to all the suburbs.

Many of the private houses, as well as the public

buildings, are very fine, and the shops are numerous and well supplied, not only with the necessaries, but the luxuries of life. Altogether, Buenos Ayres is a fine city; but it has one radical defect (apart from its unsatisfactory sanitary condition already referred to), which it is to be hoped will before long be effectually remedied. Its approach from the river, when I first saw it, was of the worst and most difficult kind. The large ocean-steamers had to lie out in the roadstead from six to seven miles, and sometimes even farther from the shore, there being an insufficient depth of water to admit of their coming closer in; so that it will easily be understood how great discomfort this entailed upon passengers landing and embarking in rough or rainy weather, especially when, as often happened, a second transhipment had to take place into a smaller boat, by reason of the excessive shallowness of the water near the shore when the wind blows down the river; nor did it unfrequently occur that the passenger and his luggage had to be further transferred into a cart a couple of hundred yards before dry land was reached, and thus he was conveyed in triumph, bumping along to where the custom-house officials waited to examine his luggage.

Such were the annoyances attendant upon the landing or embarking of passengers, and the vexations, delays, and cost of landing merchandise were

proportionately great. Here again, as at Monte Video, various projects for the construction of a harbour have been proposed at different times, that of Mr. Bateman being on a very complete and extensive scale ; but, although a number of costly experiments and investigations were undertaken and carried out in connection with it, the comprehensive project was abandoned in favour of a more restricted one for providing wharfage accommodation along the banks of the Riachuela (a small river flowing into the Plate a mile or two below Buenos Ayres), and at the same time dredging a channel of sufficient depth for ocean-steamers and shipping generally to approach it from the roads.

From a recent report by Mr. Huergo, the engineer of this undertaking, it would appear that considerable progress has been made with the works, which, when finished, the promoters feel confident will fully meet the requirements of the large and growing trade of this important port.

That the members of the Provincial Government are not quite so certain on this point may be inferred from the fact that the Legislature has authorised the issue of a new six per cent. loan for two and a quarter millions sterling,* to construct another

* A prospectus has lately appeared in London, dated 29th October 1883, for a Buenos Ayres six per cent. Government loan of £2,254,100 (\$11,000,000), for the construction of a port at Ensenada, and the

harbour at Ensenada (some thirty miles farther south), where the new provincial capital is to be, for which purpose it has been re-christened "La Plata," as a more euphonious name, or one suggesting greater wealth and consequent importance, while the city of Buenos Ayres, itself formerly the capital of both province and republic, is now to be reserved for the seat of the National Government.

The province of Buenos Ayres, by far the richest and most important of all the Argentine Confederation, is thickly populated in the vicinity not only of its principal city, but also of the minor towns it

following extract from a memorandum by Señor Don Gabriel S. Martínez is taken from it :—

"In virtue of the Law of 7th August 1883, issued by the Legislature of the Province of Buenos Ayres, it has been resolved to construct the 'La Plata' Harbour on the site called the Ensenada, and for this purpose a foreign loan of \$11,000,000 is created.

"This harbour, which belongs to the new capital of the province, is only thirty miles distant from Buenos Ayres, and is in constant communication with it through the Buenos Ayres and Ensenada Railway, and is also connected by a branch line, twenty-six miles in length, with the Southern Railway of Buenos Ayres.

"It is thus in railway communication with the whole province, and is situated in the best position for the shipment of its exports and for the landing of its imports.

"At present, ships of large tonnage have to anchor in the roadstead outside, at a distance of more than five miles from the city of Buenos Ayres, and although the works carried out for the canalisation of the Riachuelo have afforded some facilities to vessels of shallow draught, it is still imperative to proceed with the construction of the La Plata Harbour, in order to meet the requirements of the extensive mercantile and agricultural traffic which is being developed in the most marvellous manner at Buenos Ayres."

possesses, and the tide of immigration extends what may be called the radius of civilisation year by year with regularity and rapidity, keeping pace with the requirements of the sheep-farmers, which increase according as facilities are afforded for the transport of their wool and other produce to the market, by the network of railways steadily stretching out in every direction over the surface of the country.

It is, in fact, principally to this element of national progress that Argentines, if they be wise, will look for the fulfilment of the glorious future Nature has prepared for their country, should they know how to reach it by the proper course.

Land so level, or with undulations of such an easy nature that earthworks in the construction of railways are reduced to a minimum, while unimportant rivers, few and far between, call for no great works of art to span them,—such are the general conditions under which railways have to be constructed on the Pampas of South America, where their cost should be but little and the traffic they accommodate considerable, and every mile of railway laid down will go to increase the population and prosperity of the country and promote its progress; for it has been well remarked that the best evidence of the state of civilisation of any country is to be found in the facilities for intercommunication which its inhabitants possess. With such sur-

roundings, the countries of the River Plate should be for all their railways, what they are with some, the paradise of shareholders.

The soil of the country generally is extremely fertile and the climate healthy ; while, rapid as has been the growth of the population, it would have been still greater but for the unprotected state of the frontier and the perpetual invasions of the Indians to which it was exposed. Of late years important action has been taken in this matter by the Argentine Government, and a new and considerably advanced line of frontier has been established, very much to the south, along the Rio Negro, which it is confidently expected will add greatly to the security of the settlers in the out-lying and thinly populated districts. It is to be hoped that these expectations may prove well founded ; but, if so, the new frontier must be something more of a reality than the previous one, which offered no serious obstacle to the raids of the Indians, who crossed and recrossed it at their pleasure.

To return to the immediate object we had in view. Upon our arrival in Buenos Ayres, after paying visits of ceremony to the President of the republic, the Governor of the province, the Minister of Finance, and other important officials, negotiations in relation to the expedition were opened. At the

first business interview with the Minister intrusted with the organisation of the project, he handed me for my information two official letters relating to the matter, requesting me to give him my opinion on the subject after reading them. One was from the General commanding on the frontier, and was addressed to the President of the republic in answer to inquiries the latter had made as to the dangers likely to be incurred by the party of explorers, and the means necessary for protecting them. The other was from the Governor of Mendoza in reply to similar questions regarding the route through his province. The following translated extracts from them will be sufficient to explain the nature of these communications, and indicate the undesirable position in which we found ourselves:—

From the General Commanding on the Frontier to the President of the Republic, 20th May 1871.

“In reply to the questions, ‘Is there great danger along the whole route? At which portion will the danger be greatest?’

“Along the whole route there will be danger. Your Excellency can perfectly understand that an enterprise like this, the tendency and object of which some persons will be sure to explain to the Indians, will raise a great excitement among them. It is useless to think of appeasing them; the only

thing of which the Indians will remain convinced is that we are about to usurp their territory. It will no longer be a question of coming to terms, and they will wage with us a bloody war, because they will not fail to see in the enterprise under consideration a question of life or death—a question of usurpation, which will oblige them to solicit from their neighbours a place of refuge, and to such position they will not submit except under the strongest compulsion. Reasoning, promises, presents, all will be useless. There will be no remedy but force.

“ ‘ What force should accompany the expedition ? What weapons would be preferable ? ’

“ Your Excellency says that one battalion and one regiment will start from Buenos Ayres. So much the better ; but it is more than enough. A force of both arms can come from Buenos Ayres in numbers such as your Excellency may consider desirable ; but whether sufficient or scanty, I will do as I say to your Excellency—advance troops with the object of protecting the expedition along the whole extension of the line, notwithstanding the dangers.”

The Governor of Mendoza, on his part, writing to the President of the republic, said—

“ According to the information of Dr. Day, if the engineers who pass the Planchon to examine

the line laid down by Rosetti for the railway to Buenos Ayres should follow an eastwardly course, the dangers are imminent, and their deaths certain.

“ From San Rafael to the line marked by Rosetti a little above the confluence of the Rio de las Barrancas with the Rio Grande, there are at least eighty leagues of way, and the whole of this route is in the power of the Indians. The expedition proceeding leisurely, all the tribes would enter upon a campaign to disturb the projected survey, and a strong army will be necessary to hold them in check.

“ Supposing a treaty were possible, I do not think or believe one could rely upon the promises the Indians might make.

“ The eighth article of the agreement for the exploration of the line stipulates that: ‘ For the protection of the engineers who have to make the survey, the Government of Buenos Ayres at its own cost, or the National Government at its request, shall place at the disposal of the engineers a force adequately provided with every necessary.’ According to the information that I have been able to obtain from competent persons, this force cannot be less than fifteen hundred soldiers perfectly equipped.

“ From the point indicated (Rio Grande) pro-

ceeding eastwards, until meeting with the Rio Chalileu, which is the eastern limit of this province, is at least forty-five leagues, by the way that Don Luis de la Cruz travelled in his journey from Concepcion in Chili to Melincue in the year 1806. This route enters the territory occupied by the Indians, and the difficulties increase with every step that one takes to traverse it. The Indians of Chili, when making their frequent excursions through our territory, often take the direction I have indicated; so that if they should be moving about here, the enterprise would be the more dangerous."

The Governor's letter then went on to propose the adoption of another route, which he stated his belief could be surveyed in safety under the protection of a much smaller military force than that previously mentioned, and added—

"In order to make the survey of the line traced by Rosetti (that contemplated by the Government), war with the Indians is inevitable; while to endeavour to have peace with them as a means of safety, would be to deliver up the expedition to the good or bad faith of the savages, which I believe to be a dangerous proceeding."

This was by no means a pleasant introduction to the business we had in hand, as it was impossible to doubt the correctness of information

derived from the highest and most trustworthy official sources. It was evident that we had embarked upon an undertaking of a very formidable nature, and likely to be accompanied by far greater risks and dangers than we had been led to anticipate.

Feeling certain, however, that the general opinion of the members of the staff would concur with my own in the matter, the answer I returned to the Minister was, that, in view of the information contained in the letters he had given me to read, no doubt the Government would take every precaution to guard against the risks and dangers therein pointed out, and that, so far as we were concerned, after coming all the way from England, we would not draw back in consequence of finding matters so much worse than we had been led to expect, but were prepared to cross the Pampas at all hazards.

Then began a series of consultations at which the opinions of various persons supposed to be well informed in the matter were elicited, and it soon became apparent that all that had previously been done was to make preliminary inquiries, such as those before referred to, but that no practical step had been taken towards making the necessary preparations for dispatching the expedition.

Negotiations with the Government dragged slowly

on, and it was most disheartening, as days and weeks passed by, to think we were apparently no nearer the accomplishment of our object than at the beginning. Expenses were daily increasing, and everything looked as if the whole affair would end in failure, so that I was obliged to call the attention of the Minister of Finance to the matter in a letter from which the following is an extract:—

From R. Crawford to the Provincial Minister of Finance, 26th July 1871.

“I avail myself of this opportunity to remind your Excellency how essential it is that the departure of the engineers destined to make the explorations of the route across the Pampas should be no longer delayed. I am most unwilling to take any step which might appear intended to urge the Government to make a hasty decision in the matter, and for this reason I trust your Excellency will permit me to refer to the following facts as a proof that such is not my desire.

“Mr. Villegas, Argentine Consul at Monte Video, called upon me on 20th April last, and read me a telegram from your Excellency’s Government asking if I was willing to come to Buenos Ayres during the epidemic. My answer was that I was ready to do so; and on the same day I addressed a letter to

him to that effect, pointing out the arrangements which would be requisite, in order to obviate the necessity for the other members of the surveying staff undergoing undue risks, by being detained in the districts where the yellow fever was making its ravages, while the necessary preparations for the expedition were being attended to. At the same time I took the liberty of making some suggestions for the consideration of your Excellency's Government as to a few preliminary points upon which, in my opinion, a decision ought to be arrived at.

“From time to time I had several subsequent interviews with Mr. Villegas, and although naturally somewhat surprised that nothing was done with respect to my offer (in reply to the Government telegram) to go to Buenos Ayres for the purpose of beginning the explorations, I fully realised the paralysing effect which the plague that was devastating the country must have had upon all public business, and for that reason I abstained from troubling the Government with undue pressure, hoping that the preparations, which I was informed were being made, might speedily be completed, and that an early order would be given to commence the surveys.

“Five weeks have elapsed since my arrival in Buenos Ayres, and although I am most anxious for the departure of the expedition, I have waited

patiently in order that the Government might be able to mature its plans. For this reason I am persuaded your Excellency will acquit me of any wish to be unduly pressing in the matter, and that you will believe me it is the necessity for action which obliges me to urge for a speedy decision.

“I hope, therefore, that I may expect to receive, at your Excellency’s earliest convenience, the order to begin the explorations, since, in addition to the very serious expenditure which your Excellency is aware is daily incurred, all further delay cannot but have most embarrassing consequences, and may complicate matters by upsetting all our arrangements.”

The result of this letter was that a Government Commission was appointed on August 5th to examine into the whole matter, and report as to the most desirable route to be followed and the arrangements necessary to be made. In repeated conferences with this Commission the project was discussed in all its bearings, and among other points my opinion was asked regarding the route to be followed, to which my reply was to the effect given in the following extract from the published Report of the Commission :—

“The Commission, in fulfilment of another of the attributes conferred upon it, proposed to the engineer already named (R. Crawford), as a measure

tending to facilitate his undertaking, whether he would prefer to execute his survey by other route than the one determined on; but this gentleman declared that, for his part, he would follow the line that might be indicated to him, whether the straight one crossing the desert, or any other."

For its own part, the Commission was beset with difficulties upon this point. The Governor of Mendoza had estimated the smallest force that would be necessary for the protection of the surveying party at 1500, while the President of the republic declared himself unable, without the sanction of Congress, to supply any such force. In this dilemma the Commission reported in favour of a somewhat more northerly route, so as to bring the exploring party within easier reach of assistance from the frontier; and this suggestion, meeting the approval of the Government, was ordered to be carried out.

Here at last a gleam of sunshine brightened our long period of hope deferred, and gave promise of a start on our journey without much further delay; but our troubles and disappointments were not yet ended. Innumerable difficulties and delays arose in making the arrangements for fitting out the expedition. Instead of the breech-loading rifles we had asked for to arm the workmen of the party, muzzle-loaders of a most inferior description were

supplied. In reply to our remonstrances we were told they were excellent weapons, manufactured at Enfield. No doubt the authorities believed they were right in this assertion, but, all I can say is, if these rifles constituted fair specimens of what Enfield produces, the sooner that small-arms manufactory is done away with the better, for a more useless weapon was never placed in the hands of any soldier. Of the entire number furnished, we selected twelve, which with considerable coaxing could be got to go off the third time the hammer fell upon the cap; the others we rejected and left behind us. This was a very serious matter, as the fate of our party, if attacked by Indians, would in all probability depend upon the rapidity and precision of the fire with which we could defend ourselves. Fortunately we were able to procure some French breech-loading military rifles, which an enterprising importer of hardware goods had got in stock. These, together with the arms brought with us from England, and a few Sniders we picked up in Buenos Ayres, mustered in all forty-two good weapons, armed with which we were in a very fair condition to take the field.

Other obstacles of minor importance, but scarcely less annoying, presented themselves almost at every step. Some of the bullock-carts provided for us were old and broken-down, and totally unfit to

start with on the journey. This had to be rectified by replacing some of the worst and repairing others, causing of course additional delay, as did also the necessary supply of horses, for which we had to wait; and when they did arrive at last, those intended for draught purposes were but of little use to us, being, as one of the staff expressed it in a letter to a friend which I afterwards read, "Not much broken to harness, while the carts were very much so." Gradually, however, one by one our difficulties were overcome, and as it drew towards the close of our preparations our spirits grew proportionally higher. We left Buenos Ayres upon August 17th, and took up our quarters at Chivilcoy 100 miles to the west of it, which was to be the starting-point of the expedition.

On the eve of our departure we experienced a severe thunderstorm, unusually heavy even for that land of surprising electrical phenomena, accompanied by a fall of hailstones, the largest I had ever seen. Many of them were about the size of pigeons' eggs, and one which I measured (no unfair sample of many that fell), while in the process of melting, was still $1\frac{1}{2}$ inch long by 1 inch thick. Nor were we surprised to learn subsequently that large numbers of sheep had been killed in the neighbourhood by the terrible hailstorm, which fortunately proved to have fallen over no very wide extent of country.

While preparing to start, and investigating all the details of the arrangements so as to make sure that everything was ready, I noticed an apparent scarcity of drivers for the bullock-carts; and, upon inquiring into the cause, learnt that the Government, with a wise prevision, had locked some of them up in gaol, as the safest place to keep them until we required their services. Nor did I wonder at this strange precaution when, later on, I saw these objects of official care marched up from their place of confinement in charge of the police. One of them, nicknamed "El Gordo," or "the fat one," a most forbidding-looking ruffian, swaggered about brandishing a knife with the moderate allowance of some couple of feet of blade, informing us with commendable candour that he had made up his mind to kill some one, it did not matter whom. He had evidently a natural taste for bloodshed, which no doubt had been cultivated on every possible occasion, and this dangerous propensity, it may here be stated, we thought it prudent to divert into a more harmless channel than exercising it upon his fellow-men, by appointing him to be the butcher of the party when any oxen had to be killed for food, an office the duties of which he performed not only with alacrity and skill, but with manifest good-will and pleasure.

CHAPTER IV.

*CHIVILCOY TO BRAGADO AND THE
INDIAN TOLDOS.*

AT last, upon the 30th October we left Chivilcoy, and got fairly started on our journey. The entire party consisted of sixty-six persons (including our comrades sent on a month before to begin the surveys, and push forward towards the frontier as far as it was safe to go until we overtook them), and was composed as follows:—

Seven engineers, a doctor, a captain in charge of the transport service, a Government commissioner and his assistant, an interpreter, a storekeeper, besides thirty-three Europeans and two North Americans for surveying purposes, &c., and eighteen Gauchos or natives of the country, for driving the bullock-carts and horses.

The means of transport were thirteen bullock-carts and six horse-carts, with a troop of horses and bullocks numbering together 230,—some of the cattle being intended for the food of the party on the journey.

Our first day's march was but a short one—about nine miles—as the rain that fell during the previous night and morning had made the roads heavy; added to which, many of the bullocks and horses proved wild and stubborn, and hard to manage, causing great delays.

No incident of importance marked the day, except the rolling over of a horse and his rider when at full gallop in the act of trying to intercept some runaway horses. The horse was killed on the spot, his neck having been broken by the fall, but the rider fortunately escaped with nothing worse than a severe shaking and some bruises.

At nightfall we encamped on the highest ground we could find, and, having pitched our tents and partaken of our dinner and supper in one, which twin meal, being of an exceedingly simple and primitive description, did not occupy much time in preparation, we lay down to seek our first night's rest under canvas. The weather was unpropitious, and the rain, which poured down in torrents, found its way into the hastily erected tents, so that we awoke in the morning wet and stiff, after a very uncomfortable night.

There being no great inducement to remain in bed under the circumstances, we were up early, but it was long before we could resume our journey, in consequence of the trouble and delay occasioned by

the wildness of the draught oxen, and the difficulty of yoking them, which required no small amount of patience on the part of their drivers to overcome.

One of the engineers, who, in his anxiety to be off, had ventured too close to a refractory bullock with a view to helping the natives to get him into his proper place, received a severe kick from the enraged animal, which taught him to keep for the future at a respectful distance when similar operations were going on.

The perseverance and dexterity of the bullock-drivers were admirable, and were at last crowned with success, and we moved on, somewhat dispirited, however, by the wetting we had had and the unsatisfactory conduct of our cattle. After travelling ten miles during the day, we reached the river Salado; but, finding it too much swollen with the recent rains to admit of our crossing it, we encamped on its banks for the night.

Next morning two of the bullock-drivers were missing, having deserted under cover of the darkness, taking with them a revolver and saddle, the loss of which articles was more regretted than that of the men themselves, all trace of whom was lost, and our attempts to recapture them proved unsuccessful.

The weather having remained dry, the water in the Salado fell considerably during the night, and

the approaches to it improved somewhat from their muddy condition of the previous evening. We therefore attempted the fording of the river, and with much difficulty succeeded in getting all the carts and animals over without mishap; whereupon, after halting for an hour to rest, we proceeded for about eleven miles farther to the town of Bragado, where we proposed to remain for a day or two to give time for the completion of some unfinished arrangements.

Upon the way two or three of us joined in assisting to drive the horses in advance of the main party, and while passing a *pulperia* or public-house, a number of Gauchos who were drinking there came out, and, seeing a troop of horses in charge of so few men, and they "Gringos," as foreigners newly arrived in the country are called, seemed disposed to dispute our passage and not disinclined to try to take the horses from us,—a proceeding we naturally were equally prepared to resent. During the altercation which ensued, up came the rest of our party, when the Gauchos, taking in the situation at a glance, and seeing how the odds had turned against them, became as submissive and profuse in their offers of assistance as they had been rough and quarrelsome before, and so we rode on without further molestation.

Bragado, a rising little place, had some two

thousand inhabitants, and was then on the outskirts of civilisation, being not far distant from the line of frontier ; but the march of events has since altered its circumstances, by bringing it into railway communication with Buenos Ayres, while the tide of population, rolling steadily onwards, has forced the imaginary barrier between the territory of the white man and the hunting-grounds of the roving and predatory bands of Indians to a more distant point.

On November 3d we struck our tents and went forward on our journey. Towards mid-day a mutiny was reported to have broken out among the native bullock-drivers, and the officer who had charge of them requested me to arm the Englishmen and send them to compel the mutineers to march. Before taking so serious a step, which might have ended in bloodshed, or at all events disturbed the harmony and good-feeling it was most desirable should exist between the various members of the expedition, I investigated the matter, and, finding that the cause of dissatisfaction arose from the men not having received in advance that portion of their wages that had been promised to them at the time of their engagement, I gave orders that the terms of their agreement should be strictly complied with by the Government commissary ; and this, satisfying the malcontents, terminated what had threatened to become a very unpleasant episode.

Two days later we came up with and joined our advance party, there having been in the meantime no matters of sufficient interest to chronicle, as the troubles occasioned by unruly horses, and the desperate efforts of some sailors to learn to ride (setting about it in regular characteristic "sailor-on-horse-back" fashion), although at the time the source of much merriment to us all, could scarcely be expected to be equally amusing to the reader. One occurrence, however, I will refer to; it was an exciting chase after our cook, who with the mule-cart, which he took charge of and drove (containing all our culinary apparatus), had got separated from the rest, and was observed in the distance galloping at full speed towards home again. One of the engineers gave hot pursuit, and having cut off the retreat of the deserter, compelled him to return. Whether the fault really rested with the man or the mule was not quite clearly made out; but as the former expressed a great wish to be allowed to leave the expedition, he was sent off.

As we advanced, the surface of the ground became slightly undulating and the vegetation looked well, although not actually rich in point of grazing qualities. At first it consisted principally of a kind of small trefoil, unwholesome for sheep and too short for cattle; but to the eye the soft rich green mingled with pink and yellow flowers was exceed-

ingly beautiful. Occasionally large tracts of country appeared purple, and others again brilliant with crimson, where verbenæ of these shades predominated. Among these lovely flowers we found some fine mushrooms, and carried them off to add a relish to our dinners.

Snakes and large lizards (iguanas) were abundant. Of the latter we killed three, each measuring about four feet in length; their flesh was white, and by no means bad eating; but as for the snakes, although some of the natives said they were equally good food, if not superior, I cannot speak from experience, having "drawn the line" at snakes. Only one of these reptiles, that called the "Vivora de la Cruz," from a cross-like marking on its head, is said to be poisonous.

Foxes also were very numerous; they are somewhat smaller than the English kind, and of a silvery-grey colour, with a reddish tinge upon the legs.

But by far the most important animal in point of numbers to be met with here, and in most other parts of the province of Buenos Ayres, is the Bis-cacha (*Lagostomus trichodactylus*). It closely resembles both in appearance and habits the marmots or "prairie-dogs" of North America. The body is about two feet long, and the tail, which measures from ten to twelve inches, ends with a tuft of coarse

black hair. The fur is of an ashy-grey colour upon the back, and pure white on the throat, breast, and under part of the body ; large, coarse, black bristling whiskers decorate each side of the mouth ; the ears are short, and the eyes large and black. The toes of the hind-foot are three in number, while the fore-foot possesses one more. The Biscacha has four very sharp, curved, and bevel-edged, gnawing teeth in the front of the mouth, two above and two below ; they are hollow at the base and firmly embedded in the jaw to a depth of one inch, while they project an inch and three-quarters above the socket, giving them a total length of two and three-quarter inches. There is a considerable space without any teeth, and then, near the back or hinge of the jaws, they are supplied with molars.

These little animals are very numerous in the settled parts of the country, although not so abundant elsewhere. Their habits are nocturnal, or nearly so ; they sleep by day and make their appearance towards sunset. At first they sit for awhile at the mouths of their burrows looking sleepy and drowsy, but as the twilight deepens they grow lively and active enough. They live together in families like rabbits, but in burrows of great size, and supplied with many chambers, and frequently on terms of strange intimacy with their lodgers, the little burrowing owls (*Athene cunicularia*), the one in-

habiting the house by day, and the other by night, after a somewhat similar arrangement to that of Box and Cox in the play.

Biscachas have a very singular habit of collecting all the old bones and miscellaneous articles they can find in their nightly rambles, and depositing them around the entrance to their burrows, probably with the desire of gradually raising them above the level of the ground alongside as a protection against inundations during heavy rains, an inconvenience they often suffer from in the level districts they most frequent.

I recollect on one occasion mentioning this peculiarity of the Biscacha, for collecting curiosities, to a friend, a captain in the British navy, with whom I was on a shooting excursion in the south of the province of Buenos Ayres, by way of consoling him for the loss of a powder-flask which he had dropped just before nightfall, and suggesting that he would probably find it next morning at the mouth of one of the nearest "Biscacheros," as their homes are called, to where it was lost. At the time he was very incredulous, but next morning, following out my suggestion, he went in search of his missing property, and found it, as I had anticipated, at the mouth of a Biscacha hole, the owner of which no doubt had brought it home as part of the night's spoil.

I have also known them to exhibit this propensity for acquiring strange objects, in a manner calculated to lead to some inconvenience, by drawing and carrying away a large number of the stakes driven into the ground to mark the centre line of a railway about to be constructed, and more than once I have been disturbed in my sleep, by their noisy endeavours to possess themselves of our tent-pegs.

They are by no means timid animals, and will sometimes show considerable spirit if intercepted in their attempts to reach their burrows. One that I treated so, left a deep indentation with its teeth in the barrels of my gun, which I had interposed to save my legs from its attack. And another I have seen, when its escape was similarly cut off, turn upon a dog that was pursuing it, and seize him by the tail, nor relinquish its hold until it had been dragged for a considerable distance by its affrighted antagonist, retreating precipitately in dismay at the unusual caudal appendage.

The young Biscacha is very good eating, the meat being white like that of a rabbit.

For so far the most remarkable of the birds we met with was the Chajà or crested screamer (*Palamadea Chavaria*), in size rather larger than a turkey. The plumage is grey, or rather dull slate-colour, with a black ring round the neck, and a

tuft or crest of feathers from the back of the head. The legs are long and of a bright red colour. Each wing is armed with two very formidable spurs. The largest, an inch and a half in length, and very broad and strong at the base, but fine and sharp as a needle at the point, is placed at the middle joint of the wing. The lesser one, only half an inch long, is three inches lower down toward the end or point of the wing. For a bird of such size and strength of wing these spurs must make most formidable weapons.

Chajás fly well, and when high in the air soar with considerable grace and ease, without any apparent motion of their wings. In the breeding season they are generally to be met with in pairs by the side of marshy swamps or lakes, but during the winter I have seen them collected in large flocks. Their food appears to consist exclusively of vegetable substances, as in the stomachs of many I shot no trace of insects or frogs or such like was to be found. Their flesh is dark in colour and unpalatable to the taste.

I have read of these birds being domesticated and used as guardians and protectors of the poultry-yard, and I can well believe in the correctness of such accounts; but I have never myself met with a case of the kind in my travels, which have been tolerably extensive in the countries of La Plata.

Although so far inland, we encountered large flocks of seagulls, some of them of the black-headed kind. These delicate ornaments of the British coast lose all their purity of character in South America, and, completely changing their seafaring propensities, principally frequent the killing grounds, where numerous cattle are slaughtered; there they act the part of scavengers, and fight with each other over the offal in a manner that would discredit the foulest of the vulture tribe.

The "Tero-tero," or spur-winged plover (*Hoplopterus spinosus*), was always to be seen in the vicinity of water. It is one of the commonest birds to be met with in La Plata. Its first name is derived from the shrill cry with which it persecutes every invader of its haunts. All other feathered creatures seem to understand its language, and take fright when they hear its unmusical warning of the approach of danger. Like the Chajà, the Tero-tero is armed with two spurs on each wing. It is larger than the common lapwing, and stands more erect, and in colour the green of the latter is replaced by a bronzed or brownish tinge. The flesh is dark, hard, and tough, but the eggs, when fresh, are excellent, and very delicate.

Upon joining our advance party, we found them very badly off for water, a matter that became much more serious in consequence of the largely

increased quantity required now that our whole force was united. We sank a tube pump (of which we had three with us), but without success, and we had to resort to digging wells of large diameter, obtaining from them a small supply of water at a depth of nine feet below the surface.

From our camping-ground at this point we visited the "toldos," or huts of a tribe of friendly Indians, lying six miles to the north of us. Most of the men were absent, hunting ostriches; but the Alcalde of the village (for these friendly Indians live under the rule and protection of the national Government) received us hospitably, and introduced us to his very comely wife, who, like himself, was of Spanish descent.

Next day they both rode over to our tents to return our visit, bringing with them the unpleasant intelligence that there was a rumour of the hostile Indians coming in force, to make a raid upon the frontier.

Not far from our encampment I shot partridges of two different kinds; one was the ordinary or small partridge of the country (*Nothura maculosa*), and the other the "Perdiz grande," or large partridge of the natives (*Rhyncotus rufescens*).

The small partridge appears to abound in La Plata wherever suitable food and cover for it are to be found. In size it is about one-third less

than the English partridge, the colour of the breast and lower part of the body being of a yellowish-brown or warm buff, while the feathers of the wings and back have dark-brown stripes across them ; the first of the primary feathers in the wing is considerably shorter than the others, the fourth being the longest. These birds never go in coveys, although numbers of them may be found within a very small area. When first disturbed they generally attempt to conceal themselves by hiding behind any inequality in the ground, or bunch of grass or thistle that may suit their purpose ; but if driven from this shelter, they run out into the open, and try to escape by the aid of their legs, uttering as they go short sharp notes like whistling ; when eventually compelled to take to the wing, their flight is rapid and direct. Their flesh is very white, but dry, and not much esteemed for the table. Their eggs, which are uniform in shape at both ends, are of a dark chocolate or liver-colour tinged with violet, and are very large for the size of the birds.

The large partridge is about the size of a hen pheasant, without the latter's length of tail. The bill is long and fine, and the head very small in proportion to the size of the body. The first of the primary feathers in the wing, as in the case of the small partridge, is short ; the third, fourth, and fifth being as nearly as possible of equal length, and

about seven-eighths of an inch longer than the first. The colour of the primaries is of a uniform reddish brown, like those of a landrail, but rather deeper in shade; while the covering of the wings and the feathers on the back are of a rich fawn colour, striped across with dark-brown and white bars, which give that part of the plumage a mottled appearance, the throat, breast, and under part of the body being buff.

This bird is also found singly, and not in coveys. Its note is a long low plaintive whistle. When disturbed by any object at a little distance, it places its body in an erect position, and, with its long neck stretched up to its full extent, carefully watches the movements of the object of its scrutiny; but when danger threatens close at hand, its head is rested low down upon its shoulders, and it runs quickly to the nearest cover for protection. It is exceedingly unwilling to leave the ground, but when once in the air, its course is swift and long, though evidently causing laborious exertion to accomplish, as the bird, if found again soon after alighting, is apparently exhausted by its first flight, and, although it sometimes rises twice, scarcely anything will induce it to take to the wing a third time in rapid succession. Dogs accustomed to look for the large partridge quickly learn to take advantage of this peculiarity of their prey. No sooner is one of the birds started,

than the cunning dog leaves off beating and watches the flight of his intended victim, marking it down with the sharpness and precision of an old game-keeper. Then off he goes at full speed to the spot where the tired bird pitched, and if it rises again, its canine pursuer repeats his tactics until success at last rewards his cunning; but more frequently the first time suffices, and the dog's nose having detected the partridge hidden in some clump of grass, with a bound he is upon it before escape is possible. I had frequently heard of this means of capture of the large partridge, but without giving much credence to the statement till I had an opportunity of verifying it myself, which often subsequently occurred, the result being such as I have tried to describe. These birds were at one time very numerous in the province of Buenos Ayres, among the rougher places where coarse grass afforded them cover, but they are year by year growing scarcer, although in Uruguay, upon the opposite side of the river Plate, they are still very abundant in the less thickly populated districts. The flesh of the large partridge is very white, and much better than that of the small one. The egg, too, is very large, and also uniform in shape at both ends, and of the same colour as that of the small bird.

The natives capture these partridges in an ingenious manner, by making a noose of horse-hair, which

is attached to the end of a long cane. With this in hand, the operator mounts his horse (everything in the River Plate is done on horseback), and gallops along until he discovers a partridge. When he does so, he rides round the bird in gradually narrowing circles, till he gets sufficiently close to drop the hair loop on the cane-end over its head, and then with a quick twitch tightens it upon the neck of his victim, leaving the latter suspended in a fluttering and helpless condition, from which it is speedily removed to the sack that forms his game-bag. It is generally by this means that the partridges sold in the markets are taken.

CHAPTER V.

*FROM THE TOLDOS TO THE FRONTIER.—
INDIAN TERRITORY.*

UPON the 10th of November we moved our encampment about six miles forward, in a fog so dense that it was difficult to make out the right direction to go in. Having hitherto found the light carts, that were intended for rapid travelling, useless by reason of the inferior class of draught-horses supplied to us, we were obliged to fasten some of them behind the bullock-carts, to be brought along by that means.

As we were now journeying through a district where at any time we might fall in with the Indians on some of their pillaging expeditions, we were obliged to adopt means to provide against surprise. For this purpose the night was divided into watches of two hours' duration, each being kept by three of our party at a time,—a service from which I was exempted by the kind consideration of my companions ; and this system of keeping night-watch was found to be so satisfactory and convenient, that

we adhered to it for the rest of the expedition, except when, from the peculiar circumstances of the case, it was rendered unnecessary.

On the night of the 11th of November the progress of the survey necessitated our encamping where there was no water to be had, nor would the tube pump which we drove down yield any. It was a terrible privation for the poor men, who had trudged along on foot all day under the scorching heat of an almost tropical sun, to be obliged to lie down at night and try to sleep as best they could without slaking their thirst, or even moistening their parched lips with one drop of water. Nor were the unfortunate horses and oxen any better off. Well-diggers were at once set to work, and relays of men dug all through the night. In the morning we found there was a settler's hut about five miles to the north of us, and a cart which we sent off to it with empty barrels brought us back a small supply of water, but upon a second trip being made on the same errand, the well was dried up, being unable to meet the unusual demand upon it. While our messengers were away, a joyful shout from the well-sinkers announced the success of their efforts, and one of them rushed into my tent with a glassful of mud, as proud of it as if it had been nectar itself.

The men worked with redoubled energy, and a

moderate yield of water soon rewarded their exertions. I may here confess that I then and there, in the privacy of my tent, indulged in a surreptitious wash with a teacupful of the scarce liquid. No doubt it was a selfish use to make of it, but the temptation was great, and I may perhaps on that account be pardoned for the crime.

During the day an alarm was given that the Indians were coming down upon us, as a number of horsemen were seen approaching. They proved, however, to be a party from a neighbouring colony of Italians coming over to visit us, who were amusing themselves chasing deer and ostriches as they came along. At the request of the manager of the colony, I returned his visit next day, accompanied by the doctor and two other members of our party. The manager was mounted upon a splendid bay colt that had recently been captured from amongst a troop of wild horses which frequented the neighbourhood. The animal was gentle and docile, but retained, as was not surprising, much of his wild nature, starting aside at every little object which attracted his attention, and throwing his head about to look behind him for pursuers as he galloped along.

Our visit to the colony had a most depressing effect upon us, no sign of energy or prosperity being anywhere apparent. The colonists were in

a pitiable condition, and much to be commiserated, as they were subject at any moment to be attacked by Indians, without any visible means of repelling them. Their only safety, in my opinion, was due to their extreme poverty, with no flocks or herds to attract attention, or make it worth the Indians' while to visit the place. This must not, however, be taken as a fair specimen of an Argentine colony, of which there are many rich and prosperous ones, but as a special example of a very miserable one, possibly in its infancy.

On the night of the 13th November we had an example of the great and rapid changes of temperature common in La Plata during the hottest months of the year. The thermometer, which had hitherto been registering great heat, suddenly fell to 26° Fahrenheit (six degrees below freezing-point), converting the water in our tents to ice.

The following morning, taking a man with me, I rode on to a small fort called "Triunfo" (or Triumph), some six miles beyond where we had spent the night. It consisted of a few mud huts thatched with coarse grass, and occupied by fifty soldiers, the only visible fortification being a ditch of ten to twelve feet wide and six or seven feet deep, surrounding the enclosure.

After visiting the officer in command and drinking

mate (Paraguayan tea) with him, which among the natives of La Plata is always served up to visitors, in gourds, and sucked through a tube, I returned to our party, and on my way back shot two deer, a fine buck and a half-grown doe.

These deer (*Cervus campestris*) are of a small size, the male, when full grown, standing about two feet six inches high at the shoulder, and the female somewhat, but not much, less. The antlers of the former are about twelve inches long, each horn having three prongs; at least such was the case in every one I saw, and I shot a good many of them. The colour is tawny, and the venison of the doe is much better than that of the buck. However, we did not despise either of them, although they are held in little esteem by the natives. Eventually, after considerable experience had educated our tastes, we decided that the young or half-grown buck and the full-grown doe made the best roasting meat, while venison of all kinds made good soup.

Deer are very numerous on the Pampas, and at the season I am describing they go about in small herds of from three or four to six or seven, and sometimes as many as a dozen may be seen together. In the smaller groups there is usually but one male; in the case of the more numerous companies, a second or a third is to be found. These are generally young, but even when full-sized they are

evidently all in subjection to one master, as readily becomes apparent from the manner in which they make way for him by moving off on his approach.

Upon the 15th of November we advanced our surveys about six miles, and encamped at the close of an intensely hot day, near the small fort "Triunfo," previously referred to.

The officer in command came out to our tent and joined us at dinner, giving at the same time all the local information he possessed, which was but little, as he had only recently been sent to this part of the frontier. We discussed with him the risks and dangers likely to be encountered on our route, and although he seemed to think they were considerable, he was unable to give us more than a couple of men from his garrison, already too weak for its own defence. A messenger was accordingly sent off to a larger fort some distance to the north asking for an escort of one hundred soldiers, that being the smallest number the officers considered it would be safe to proceed with.

In the meantime we struck our tents on the following morning and crossed the frontier, leaving the last trace of civilisation behind us, and moving out into the hunting-grounds of the Pampas Indians. Surveying operations were proceeded with as usual, and during the day I managed to add to the contents of our larder by shooting a fine buck, and a

lizard four feet long. Our march was continued till a late hour in the night, in the hopes of finding water; but, although the country was scoured in all directions, none could be found, and at last we were obliged to halt at a place without it.

The small quantity we had brought with us from the fort had very considerably decreased during the day, and what remained of it had become both hot and muddy; but even in that condition it was far too precious for us to pay much regard to the quantity of sediment it contained. In order to economise it as much as possible, the engineers' mess agreed to club their resources and apply the aggregate result to making a common stock of coffee, it being the general opinion that in such form the mud would be least objectionable to the palate.

How anxiously we watched that kettle boil as we sat round the camp-fire in impatient anticipation of the drink that was to relieve our almost unbearable thirst! One of our party, abruptly approaching the spot on which all eyes were concentrated, whether actuated by an unlucky desire to facilitate the culinary process or for some other purpose was never made quite clear, the subject being far too painful to admit of subsequent allusion to it, when a loud shout of horror proclaimed that he had overturned the kettle, and its hissing contents were spilt in the blazing fire.

I am glad for the sake of my readers that I cannot recall the precise language in which the various degrees of dismay and disappointment were expressed by the expectant group ; but, writing from recollection, I should say it was decidedly forcible and impressive. Only those who have felt the want of water after a long day's march, exposed to the scorching rays of a nearly vertical sun, can realise the full extent of the catastrophe I have just described.

There was no remedy for the calamity which had overtaken us ; so, bracing up our endurance to a higher pitch, we lay down for the night, hoping against hope that sleep might come to us, bringing with it temporary oblivion of our wretched plight.

I cannot undertake to describe the feelings of others ; I can only say what were my own on that occasion. There I lay tossing about from side to side with my tongue swollen to twice its natural size and far too large for my mouth to contain it, while my eyes appeared, like those of a lobster, to have protruded from their sockets.

With such sensations, weary though my body was, sleep was scarcely to be expected ; but come it did at last, bringing with it sweet dreams of running water, in the luxurious contemplation of which all my troubles vanished. But oh ! the concentrated

disappointment of that first moment of awaking to find the relief was but a dream, and my throat and tongue as parched and swollen as ever.

Almost immediately I became aware that all around me was noise and bustle, and then the reality flashed across my mind. My dream of running water had been occasioned by rain, which was falling in torrents.

In less time than it has taken to describe it, every soul in the encampment was up, and out enjoying the unexpected luxury of a natural shower-bath, while outstretched tongues and gaping mouths were directed upwards to collect the falling drops for inward application. Nor were more extensive measures left unheeded. Vessels small and large were pressed into the service. Hollows were speedily excavated in the ground, and lined with waterproof coats, blankets, and tarpaulins, forming capital reservoirs; and, before many minutes were over, every man had satisfied his thirst, and our tongues had once more assumed their normal dimensions.

Two curious facts in natural history occurred at this point. A beautiful little bird of the grebe family, with very handsome plumage, was found fluttering about in the wet grass next morning after the storm. Where it had previously been no one could conjecture, as there was no trace of a

lake or watercourse anywhere to be seen; and, being a bird unprovided with wings sufficient for any great length of flight, it certainly could not have travelled far.

The other circumstance was, that the men, upon being put to sink a well in the lowest-lying land to be found near, in their excavation, at some little depth below the surface, came upon a small living eel about twelve inches long.

Perhaps the depression in the ground where the well was sunk had previously been a shallow lake, the home of both bird and fish, although all external traces of it were gone, having disappeared with the hot weather, the rapid progress of vegetation in the bed of the lake as it dried up concealing the evidence of its character; while the eel buried itself deeper and deeper in the mud according as the water grew less, and at last got firmly embedded in it, but still surrounded with sufficient moisture to sustain life in such a tenacious organisation.

A friend of mine who had travelled much in Brazil, described meeting with fish alive, after a heavy thunderstorm, upon what appeared to have previously been dry roads, accounting for the fact on the hypothesis that the roads in question were in reality the beds of watercourses which the tropical heat had recently dried up, imprisoning

the fish in the mud, from which they were washed out, still alive, by the heavy rain accompanying the thunderstorm.

I have myself seen fish collected in muddy pools, the water from which had almost completely disappeared.

In connection with this circumstance, I may mention that a neighbour of mine on the river Erne, James Dunleavy, well known to anglers as an experienced fisherman, tells a story of his having early one summer morning met with a party of eels making the best of their way to the river, across a grass field leading from a pond then drying up. That James, or the eels, or perhaps even both the parties, had been attending a wake, or dance, or other place of conviviality the night before, was suggested by a rival fisherman on the Erne; an insinuation treated by Dunleavy with the most supreme contempt.

At this camping-ground the men brought in two full-grown ostriches, which they had captured, and a number of ostrich eggs. Some of these latter were made into excellent omelets, others were roasted; but thus cooked we did not relish them so much, as they had a strong flavour, which was unpalatable; nor did the flesh of the birds themselves find more favour with us, notwith-

standing that we were treated to portions which the natives considered very delicate,—an opinion, however, we found ourselves altogether unable to concur in.

Although these birds are generally known as ostriches, *rhea* (*Struthia Rhea*) is the more correct name to apply to them. They are not nearly so large as the ostrich proper of Africa; and, while the latter has only two toes to each foot, the former has three.

The back and wings of the *rhea* are of a brownish slate-colour, but the breast and under part of the body are white. It is exceedingly fleet of foot, and, when hard pressed, uses its wings to aid it to escape. It can, moreover, turn and double with the facility of a hare, and with wonderful grace and ease in its movements.

Numerous hens combine to lay their eggs in the same nest, which is a mere depression in the ground, while the duties of caring for the hatching process, and looking after the young birds when they come out of the shell, devolves upon the cock, who discharges the office of nurse with exemplary skill and courage. It is no uncommon thing to see a large cock driving before him a numerous flock of young birds, and evidently instigating them to increased exertions to escape from their pursuers.

When overtaken and caught, their usual course is, as they are popularly supposed to do, to hide their heads under their wings or bodies or elsewhere, and in this position await with covered eyes the fate their swiftness of foot did not suffice to save them from.

The young birds are very easily tamed. A number of them taken by our men became great pets in a day or two, and wandered about through the encampment like a flock of young turkeys, without making the slightest attempt to escape. When on the march, they were kept in the ammunition-waggon, in which our reserve fire-arms stood in racks ready for use in case of alarm. This vehicle to its other functions added that of a travelling museum and menagerie, in which were congregated all the curious specimens, both dead and living, collected as we went along.

One of the most amusing members of the "happy family" thus strangely brought together, was a young fox, for which a small pet dog belonging to one of the men exhibited a strong affection, watching it carefully with a most protecting air, and allowing it to sleep between his paws.

Our dogs killed a Patagonian hare (*Cavia Patagonica*) or agouti here, and another was caught by the men. They were about two feet four inches in length, and stood fifteen inches high. The ears

are shorter and less pointed than those of an ordinary hare; the tail is also short, and the colour a greyish-brown with a black patch immediately over the tail. The fore-feet are each provided with four toes, while the hind ones have but three.

The hind-legs are much longer than the fore; and to compensate for the inequality in their length, the animal, when not desiring to run quickly, puts the whole of the lower joint of the hind-legs to the ground, to prepare for which use of it the part in question is provided with a sole (like a pad of leather) $2\frac{1}{2}$ inches long and five-eighths of an inch broad at its widest part. The cavia's usual style of slow progression is by a series of hops or short bounds, somewhat resembling the movements of a kangaroo; but, when greater speed is required, the gait is changed to one very similar to the running of a hare. The flesh is moderately good when roasted, but the best culinary purpose to which it can be put is soup, in which condition it is excellent. It is perhaps worthy of remark that we first met with the Patagonian hares about latitude 35° S., while Darwin in his account of the voyage of the *Beagle* gives latitude $37^{\circ} 30'$ as the northern limit of the zone they inhabit.

During the day there was an alarm of Indians being in sight, but they proved to be a party of

white men who had come out beyond the frontier in search of game.

The rain-water with which the favouring thunderstorm had supplied us being insufficient for the cattle and horses, they had to be sent back for a considerable distance to drink; and, as they did not return by nightfall, we were obliged to let off rockets to direct the party in charge of them to our encampment, notwithstanding that this was an undesirable process, as it might give the Indians a clue to our whereabouts.

Some time later the watering-party returned; and before preparing to lie down for the night I thought I heard the tramp of many horses; but, not wishing to raise an alarm until I was quite certain as to my facts, I preferred first investigating the matter for myself. Accordingly, taking my rifle, I passed out unnoticed by the sentry, and, having advanced sufficiently far to be undisturbed by the camp noises, I listened attentively to the sounds which had caught my ear. Proceeding cautiously and stealthily, I discovered that they were caused by some of our own horses that had strayed outside our lines in the darkness.

Upon attempting to regain the encampment, I found I had made a very serious omission in not acquainting the sentries, of whom there were always three on guard at night, with my movements.

Before penetrating far I was challenged, and, in endeavouring to explain who I was, found my answer was by no means satisfactory to my interrogator, a Frenchman fresh from the experiences of the Franco-German war, in which he had served as a soldier.

Being sufficiently near to hear the ominous click of the lock of his rifle, and expecting it to be speedily followed by a shot, for which I was by no means anxious to form the target, I at once lay down flat upon the ground to prevent his getting me between him and the sky, and thus obtaining a better mark. In this undignified position I carried on a parley, until the men, who had turned out upon the alarm being given, coming up to his assistance, my voice was recognised and I was released from the uncomfortable situation and allowed to return to my tent, prudently resolving that the next time I proposed to ramble at night, I should take care my movements were fully known to the sentries on guard.

On the 17th November the captain who accompanied us came to me with the Government commissioner, and requested me not to proceed farther until the arrival of a hundred soldiers for whom he had applied, as he considered it unsafe to advance without their escort. We were suffering greatly from want of water at the time, and, the danger of

being attacked by the Indians not appearing to be any greater while moving forwards than remaining stationary, seeing that we were already in their hunting-grounds and exposed on every side, I decided to continue our onward progress, taking at the same time every precautionary measure that could be thought of to prevent surprise.

Again during the night it rained heavily, which was a great boon to us, and next morning scouts were sent out in all directions to scour the country in search of water. Taking a man with me, I rode forward for about three miles from our party, when, on crossing some undulating land, the country having become more uneven, we observed an Indian watching us from a neighbouring hill, while at the same time he was evidently anxious to conceal himself from observation,—a matter which was not so easy to accomplish, provided as I was with a powerful field-glass. After a careful and minute inspection of his movements, we concluded that he was not likely to be alone, but that his comrades might possibly be behind the hill, and, if so, they could easily cut us off from our companions; we therefore retraced our steps, keeping a sharp look-out as we rode along. Our scouts, who returned about the same time as myself, reported having seen Indians in opposite directions; it was therefore evident that we were being closely observed and our movements

watched, so that it became necessary to increase our precautions against attack.

Although our search for water had been unsuccessful, we were more fortunate in a well we sank, obtaining from it a good supply at a depth of sixteen feet below the surface.

One of the men killed a very fine wild cat not far from our tents. It fought desperately, and was by no means an antagonist to be despised. A large toad found in a canteen bucket occasioned some perplexity as to how it got there ; but it would seem to be a habit of the race to get into inexplicable positions, if we credit the tales that are told of their hopping out in the most unconcerned way from their primeval beds of solid rock, to the great surprise of the quarryman, whose ruthless pickaxe has disturbed their lengthened slumbers.

Day broke brightly on the 20th November, and without promise of more rain ; so, filling up our water-barrels from the well, we started again on our journey, continuing our surveys as we proceeded. During the forenoon we fell in with a small party of Indians, who proved to be friendly. A little farther on we caught a horse with numerous marks of having been pricked with lances by the Indians, no doubt to force him forward as he grew tired.

We had a long and exciting chase after a fox,

which the dogs eventually ran into and killed. It was of a silvery-grey colour, and had splendidly soft fur.

I shot a deer with my rifle, and we found three ostrich nests with twenty-seven eggs in them, a welcome addition to our provisions. While galloping through the long grass, an ostrich sprang up almost from under the legs of my horse, so that I narrowly escaped being thrown by the bound which he gave to one side in his fright. It was marvellous how so large a bird could have concealed itself in such a position, not only from my eyes, but from the still more watchful ones of my horse.

During the day we advanced about ten miles, and towards nightfall, to our great delight, discovered a plentiful supply of good water in two small lakes near which we encamped, and were enabled not only to satisfy our own thirst, but to let the cattle do the same by theirs,—a luxury they had not fully enjoyed since starting on the expedition. It was pleasant to see them standing in the water when they had finished drinking, and to hear the oxen lowing their gratitude for the unaccustomed blessing.

That night two of our men were missing, which caused us much uneasiness, as we feared they had been taken by the Indians. An occasional rocket was sent up to provide for the case of their merely having lost their way in the darkness.

Early on the morning of the 21st a military escort, consisting of three officers and fifty men, joined our party, being just half the force applied for; and later in the day the two missing men came up. They had lost their way on the march the previous night, and had not seen the rockets we let off to guide them to us, so wisely lay down to sleep until daylight enabled them to recover the track of the party and follow it up.

Soon after the arrival of the soldiers, I took fifteen of them and an officer with me, and rode nine or ten miles ahead of the surveying party to examine the nature of the country and look out for water. On our way we fell in with a troop of wild horses, with flowing manes and tails sweeping the ground. Those who have only seen horses in their domestic condition can form no idea of the grandeur and spirit of their wild relations, in the natural state of freedom from man's control.

When first their attention is arrested by the approach of any suspicious object, the more daring members of the herd, with heads erect and ears pricked up, advance a little towards the apprehended danger; then stopping, snort and paw the ground in evident disapproval of the intrusion on their quietude. All at once, and without any apparent cause for increase of fear, off they gallop in wild career, as if their safety depended solely on

their speed; but before long round wheel the leaders, and, followed by the rest, trot boldly back towards the intruder, for another look at him, repeating this process so long as they are not closely followed; but, if hotly pursued, their course is straight away until they are lost to sight.

Meeting with horses on this occasion led us to hope that water could not be far off in any district they frequented; but, although we looked for it on all sides, our search was fruitless; so we returned with the depressed feeling that we were likely, in the country before us, to have a repetition of our previous experience of the horrors of unquenched thirst.

Fortunately rain fell heavily during the night that followed, and as much of it as could be collected was stored for our journey.

At 7 A.M. we struck tents and pushed forwards. About mid-day several small parties of Indians were observed in different directions, causing us some alarm. The bullock-carts were arranged so as to form a hollow square, into which the horses and oxen were driven for protection, and means of defence were rapidly taken in case of our being attacked. A sentinel was posted on the top of one of the bullock-carts to observe the movements of the Indians, while mounted soldiers were sent out to reconnoitre them. These messengers returned

with the report that the Indians we had observed belonged to Coliqueo's friendly tribe, whose "toldos" we visited near the frontier.

While on the march to-day a puma (*Felis concolor*) was driven out of the long grass by the dogs, and in attempting to skulk off was overtaken by one of the mounted natives, who dexterously entangled its legs with the "bolas," when it was easily dispatched by a shot from a revolver. Its length was seven feet two inches, including the tail, which measured two feet seven inches.

The puma (commonly called the South American lion) is a cowardly animal, totally unworthy of the grander name; and, although he may work terrible havoc among sheep or calves, could scarcely, I think, be induced to face a human adversary, except when rendered desperate by the impossibility of escape.

It may here be said that the teeth of the specimen above referred to subsequently split up longitudinally in a most extraordinary manner,—an occurrence for which I am unable to assign any reason.

Another puma, not quite full grown, had on a former occasion been killed in the vicinity of our encampment.

The "bolas," of which I have made mention, constitute the universal weapon of the Gauchos of the Argentine Republic, who exhibit an expertness

and accuracy of aim in the use of them that constant practice alone can give.

This implement usually consists of three balls about two inches in diameter, but frequently much smaller. Two of them are heavy, and composed of stone, or sometimes, especially in the case of small ones, of lead; the third is about the same size, but of a lighter material than the others. Each ball is attached to the end of a piece of plaited raw hide about two yards long, the other ends of these thongs being made fast together in a knot. When about to be used, the lighter ball is held fast in the palm of the hand, which is swung round the head in a circular manner, causing the two free balls to revolve at the end of their thongs. When a sufficient velocity has been obtained, the whole weapon can be thrown to a considerable distance at the intended victim, whose legs it seldom fails to entangle,—the balls winding round them in opposite directions, and tying them up securely. The "bolas" such as I have described are those usually employed for catching horned cattle and horses, or the larger kinds of wild animals, while for ostriches much smaller balls, and only two tied together instead of three, are used.

We also saw some more wild horses to-day, and found two ostrich nests, one containing seventeen and the other sixteen eggs, which kept us plenti-

fully supplied with omelets. In the evening we encamped beside three small fresh-water lakes, upon which I shot three wild-ducks and an ibis.

Two of the bullock-drivers fell out after arriving at our camping-ground, and handled each other pretty roughly, for which misconduct they were punished by being placed in a crouching position opposite each other at some little distance apart. Each had his wrists tied together, and a rifle inserted under his knees and above his arms, which gave him the appearance of a trussed fowl ready prepared for roasting; in which helpless and uncomfortable plight they were left glaring at each other for a considerable time. This is a common military punishment in South America, but I had not previously seen it put in force; and in the present instance the treatment seemed efficacious, as when released from their bonds neither party evinced any apparent desire to renew the quarrel, nor did they afterwards interfere with each other.

CHAPTER VI.

INDIAN TERRITORY—MEDIA LUNA.

ON the morning of November 23d, which was dull and rainy, determining to explore the country for a considerable distance in advance, I started off accompanied by an officer with fifteen soldiers, and two of our own men. After proceeding about twelve miles we saw a herd of deer, to which we gave chase, and, having surrounded them, succeeded in capturing some with the "bolas," in the use of which the soldiers were very proficient. The excitement of the pursuit caused me somewhat to overstep the bounds of prudence by separating myself too far from the rest of the party, in my desire to secure a fine buck, whose antlers I coveted as a trophy; but a shrill whistle from the officer attracted my attention, and, discovering that my companions were gathered together in a group at some distance from me, I galloped up to them, and learned that they had sighted a large party of Indians approaching us

from a direction that rendered it impossible to retreat upon our main body.

My field-glass was at once brought into requisition, and, as it left no room for doubt about the matter, it only remained for us to prepare for the attack, and to fight hard and sell our lives as dearly as we could.

When the Indians came closer we could count about 150 of them, nor could we be sure that these were all we should have to meet, it being very possible that the undulating land might conceal others from our view.

Our position at the moment was anything but agreeable. The officer had given the command to dismount and "hobble" the horses' fore-legs in such a manner as to prevent their escape in the confusion of fighting; he then formed his men into a compact body on foot to resist the expected attack.

Our anxiety was considerably increased by a circumstance of which I had not been previously made aware, that six of the fifteen rank and file we had with us were Indians, who had been taken prisoners only a few months before, and forcibly converted into unwilling soldiers; and that they would take part against us in the coming struggle, as soon as an opportunity for doing so arose, was more than probable.

When within about a mile of us, the Indian party halted and collected in a group, apparently consulting together as to the plan of attack to be adopted. We sent out two soldiers on horseback to examine them more closely, who brought back the good news that they belonged to a friendly tribe. This was indeed a great relief after the intense anxiety we had gone through during the previous half-hour. I proposed to go and see them, and ascertain if they could give us any information as to where water might be found in the line of country we were following. To this the officer at first demurred, thinking that they might not be quite so harmless as was supposed ; but after a while he yielded, and we rode over to them.

Upon approaching the Indians, we saw that they formed a dense circle with the horses' heads all pointing towards the centre, and they were apparently in deep consultation ; but as we came closer, those nearest us wheeled rapidly round and faced us.

About a hundred yards before reaching the group we halted our men, and the officer and I, taking an interpreter with us, rode slowly forward, the Indian chief on his part, accompanied by a couple of his principal followers, coming out to meet us. We saluted and shook hands, as they held out theirs to us, evidently considering that this was the pro-

per way to greet the white man in a friendly manner.

Mutual explanations occupied some little time, and proving satisfactory, the chief made a sign to the others, who immediately closed in, our men following their example, whereupon a complete round of hand-shaking had to be gone through, and general bartering for the skins of wild animals began. The manner in which this was conducted was highly creditable to the character of the Indians as sharp men of business, gifted with a very fair appreciation of the value of the goods they had for sale. While this was going on, the chief preferred a request that he should be permitted to talk with one of the soldiers, who he said was a relation of his, his keen glance having penetrated the disguise of the Argentine uniform. Permission being given, the soldier, one of the prisoners recently made and converted into a trooper, as already mentioned, approached the chief and halted about three yards in front of him. No outward salutation passed between them, but they conversed in their native tongue for about five minutes in a grave and dignified manner. The chief then addressing the officer said, as the interpreter explained, "I am the white man's friend ; be kind to my relative ;" and we parted, as we had met, with a salutation, the Indians all calling us, in Spanish, "brothers," as we rode away.

At the interview just described we had obtained some useful information about the districts in which water was to be found.

While riding back I conversed with one of the two civilians I had brought with me in the morning. I noticed him unusually excited during the time our fate was in suspense, before we discovered the Indians to be friendly disposed, and, as I had always known him to be cool and collected, I was anxious to ascertain the reason of the apparent change in his character wrought by meeting with Indians.

I wish I could tell my readers, as graphically as he told me, the history of an adventure which the scene of the morning had brought back to his memory with a distinctness only too vivid.

At the time of the occurrence to which I refer, he was living with a comrade in a rancho on the frontier, in a somewhat advanced position, but not otherwise considered particularly exposed. Having occasion to visit another settler a little distance off, he was obliged to remain there for the night.

As he rode home in the morning, he experienced an uneasy sensation stealing over him when he saw no sign of horses or cattle anywhere about the ground they usually occupied. Upon entering the hut, his apprehensions were still further raised by the confusion in which its contents were tossed on all sides. No responsive answer coming to his loud

calls for his companion, whom he had left in charge the day before, he set about a systematic search, and at last, in the small plot of garden which had formed the occupation and solace of the leisure moments of their lonely life, he came upon the dead body of his comrade, stripped of all clothing, and marked with numerous spear-thrusts. The terrible reality was clear enough. During his absence the Indians had attacked the hut, killing and stripping its defender, and driving off the cattle. While buried in deep thought reflecting on the sad fate which had overtaken his unfortunate companion, a whiff of smoke wafted to him from the chimney of the hut close by called his attention to the fact that the fire on the hearth was still alight, therefore the tragedy could only have occurred that morning. Nor was corroboration of this inference long wanting. Almost immediately a sound as of approaching horses met his ear, and, looking in the direction from which it came, he saw to his dismay a band of Indians riding towards him at full speed. Not a moment was to be lost; so, rushing to the horse, which in the first confusion of his arrival he had fortunately tied up before the door, instead of liberating him as was his wont at other times, he slipped the knot, and in a moment jumped into the saddle and was off, as hotly pursued by the yelling Indians as ever fox was followed by a pack of hounds. His in true earnest was a ride for

life; and, as mile by mile was covered at full gallop, he saw to his horror that the Indians gained upon him in the race, while at the same time his horse showed signs of evident distress, which threatened before long to bring the matter to an abrupt and fatal end. To relieve the horse of all the weight he could became the only chance remaining ; so, gradually untying the fastenings of his heavy native saddle as he went along, he slipped it from under him, letting it fall upon the ground, and continued his ride on "bare back." The faithful animal, released from the extra weight and pressure, moved forward with more ease and speed, increasing at each stride the space between pursuers and pursued, until at last he brought his rider safely to a settler's homestead, where friendly aid coming in good time, arrested the progress of the Indians, and eventually drove them off, giving as they went a parting yell of baffled rage and disappointment, that still rang freshly in the ears of the narrator whenever he recalled the scene.

The story as he told it was so intensely sensational, that, do what I would, I could not shake off the vivid and painful impression it left upon my mind, and it was with the greatest relief that we sighted a flock of deer to which we immediately gave chase, working off our superfluous excitement in the capture of two of them with the "bolas."

In the evening a messenger arrived with a dis-

patch from the frontier, informing us that a party of hostile Indians of Calfucura's powerful tribe were marching towards us, so that the watch was kept with redoubled vigilance. That night our sleep was naturally not very sound, as each man lay upon his arms, expecting to be aroused from his slumbers at any moment by an attack of the enemy, but nothing of the kind occurred.

Next day, the 24th, and the following one, were intensely hot, and in the evening of the latter we encamped near a fresh-water marsh, to the south of a salt-water lake, about three miles long and one across, called the "Laguna Salalé," where I shot eight wild-ducks, one grey plover, two stilt plovers (*Himantopus nigricollis*), and three ibises (*Theristicus melanops*). Another of the engineers shot a deer, and one of the soldiers caught an ostrich. We saw the footprints of a puma in the mud at the water's edge, but failed to drive it out of the tall coarse grass, where we had no doubt it lay concealed. During the following night a heavy thunderstorm broke over our encampment. The guard-tent was blown down, and most of our blankets were drenched with rain.

To the north of the "Laguna Salalé" there was a stunted tree, the first we had seen since leaving the settlements, the country all the way having been quite clear of trees or shrubs. Two large lizards (iguanas) that were killed here, measured each about

four feet in length. In the stomach of one of them was found a partridge egg whole, and the body of an unfledged partridge. Patagonian hares were very numerous in this vicinity, we having started six of them in a ride round the lake.

At dinner-time on the 26th, we were disturbed by the sentries passing the word that the Indians were approaching. All the party were soon under arms, but the alarm proved to be false, clumps of pampas grass in the distance having been mistaken for horsemen, and we returned to our food with unimpaired appetites. The day had been close and sultry, mosquitoes annoying us greatly; but a heavy thunderstorm occurring in the night, accompanied by much rain, agreeably lowered the temperature, and put an end to the teasing activity of our insect tormentors for the time.

On the 27th we reached some fresh-water lakes about six miles beyond the "Salalé." I shot four large black ducks and a plover on the way, while the rest of the party secured three deer and a Patagonian hare. We also saw some ostriches, and caught a horse belonging to the Indians. Three small thorny shrubs were met with and cut down for firewood, of which we sometimes stood in great need, when the dry stocks of thistles, our usual fuel on the Pampas, could not be obtained.

November 28th.—We continued surveying opera-

tions, and got to a camping-ground with good water. A soldier killed a beautifully marked wild-cat here with the "bolas," and I shot four wild-ducks. One of them falling in the middle of a small lake, was immediately seized by a large lizard, which swam to shore with the duck in his mouth; whereupon I shot the amateur retriever *in flagranti delicto* as he was attempting to scuttle off into the long grass with his prey. The lizard was about four feet in length, being as nearly as possible the same size as those we had previously killed.

To-day a soldier reached us bringing the news of two Indian invasions, one behind and the other in front of us. The commanding officer at Fort La-ville, about forty miles to the northward, in sending me notice of a body of between four and five hundred Indians having crossed the frontier, suggested that we should repair to the nearest fort for protection.

Anticipating that invasions of the kind might be looked for as matters of frequent occurrence, and that, if we had to retreat for safety to the frontier upon every approach of Indians, but little time would be left for surveying operations, I was most unwilling to leave off work, especially as the members of my staff unanimously shared my views and feelings in the matter. However, upon consultation with the officers attached to the expedition, who,

from their knowledge and experience of warfare on the frontiers, were necessarily more competent than the rest of the party to form a correct estimate of the risks and dangers to be encountered in continuing the surveys, I found they were decidedly opposed to our doing so in our then insufficiently protected condition, and strongly advised our following the suggestion of the commanding officer at Fort Lavalle.

As the decision to be taken in this most serious crisis appeared to involve on the one hand the safety of the exploring party, and on the other the probable fate of the expedition, I investigated the matter in all its bearings, so as, if possible, to devise some means of extricating ourselves from the difficulties of our position; but the more closely it was examined the worse did it appear. The captain of the escort informed me that sixteen of the fifty men under his command were Indian prisoners lately made soldiers (we already knew that this was the case with seven of them, as previously mentioned), and that he could not trust them if called upon to fight against their kindred; adding that, under any circumstances, he should be unable to accompany us if we went on, his duty being to obey instructions he had received and repair with his men to the nearest fort. It was, therefore, useless to attempt to fight against obstacles we were powerless to overcome. Accordingly, with a sad heart, I

reluctantly gave orders that surveying operations were to be discontinued on the following evening, when we would march for a small fort about twelve miles to the north of the point upon our line we should probably have reached by that time.

In pursuance of this arrangement we drove, on the afternoon of November 29th, our last peg solidly into the ground to a considerable depth, and, having heaped a large mound of earth over it surrounded by a deep trench, to enable the point of leaving off to be recovered with ease upon again taking up the work, we struck northwards for the frontier. Game and wild-fowl were everywhere abundant. I shot a deer, two large partridges, and thirteen ibises, of which latter there were two kinds—the larger about the size of a curlew; its colour was a mixture of dark green and brown, shining with a metallic lustre; the other kind of ibis was that more commonly met with, and was one-fourth smaller and of a dark green glossy plumage.

After a march of four or five hours, we reached Fort Media Luna, or Half-moon, so called from the shape of a lake lying near it. Like Fort Triunfo, it consisted merely of a few grass-thatched huts surrounded by a ditch and mound, not much more formidable than an ordinary fence. Our military escort took up their quarters inside the enclosure, where they joined their companions in arms, thirty-

six in number, who formed the garrison of the place, while the surveying party encamped outside.

All here was stir and bustle, small detachments of men coming and going, orderlies galloping backwards and forwards with dispatches. It appeared that an Indian invasion on a large scale had taken place close by, four days previously, and they were now scouring the settlement and carrying off cattle in every direction. As far as we could learn, no attempt was made to pursue them, but everybody seemed to be upon the alert, waiting in expectation for their return towards the centre of the pampas with their plunder and booty, when they were if possible to be intercepted. We here heard confirmation of a report that had previously reached us of another Indian raid behind us, a small fort having been attacked and the few men who held it killed or carried off prisoners.

The confinement to our encampment for the next couple of days, nothing having been seen of the Indians near us in the meantime, proved so irksome, that some of us decided on December 2d to go down to the lake, a couple of miles distant, to shoot wild-fowl, arranging with the people at the fort to recall us in the event of Indians appearing in sight. The signal was to be the firing of a gun and hoisting of our English ensign on the flagstaff.

We had scarcely been an hour at the lake, where

we were enjoying very fair sport—I had got to my own gun three wild-ducks, a flamingo (*Phoenicop-terus roseus*), and six plover—when the preconcerted signal of recall was given from the fort. We lost as little time as we could in retracing our steps, watching carefully on all sides of us for our foes as we galloped back. The cause of alarm was the appearance of a body of three hundred horsemen, at first taken for Indians, but proving to be soldiers coming to reinforce the garrison at Media Luna, as it was expected at head-quarters that the Indians would recross the frontier close to where we were.

In the state of excitement which prevailed it seemed useless to return to the lake to resume our shooting, and we had time to set to work to skin the beautiful flamingo, which I was anxious to add to my collection of specimens.

The South American flamingoes are much smaller than those that inhabit Africa, but are richer in colour. They stand about thirty-two or thirty-three inches high when "at ease," or when watching some distant object, although they can at will stretch out their necks to the much greater length of forty-four inches, as when flying, which they do with both legs and neck extended after the manner of storks, and not like the plan adopted by the heron family of resting as much of their necks as they can doubled back upon their shoulders. The legs are

about fifteen and a half inches long, exceedingly thin, and of a bright red colour. The feet have a web between the toes. The length of the body is ten inches, and that of the neck, head, and bill, taken together, nineteen inches ; the bill alone is four and a half inches long, and is bent in shape ; it is yellowish down to the bend, and black from that to the point. The upper mandible is little more than a lid or covering for the lower one, and the latter is well filled up with a large, soft, orange-coloured tongue, which (in the African bird) was highly prized as a table-dainty by the ancient Romans. The eye is remarkably small for the size of the head. The general plumage of the body is of the most delicate roseate hue, while the covering of the wings, and the tail feathers, are bright red, the pen feathers are black, and the rest of the under side of the wings of brilliant crimson, so that it is when flying the flamingo appears to best advantage. These birds are often to be seen wading in the shallow salt-water lakes which abound in the pampas in such numbers as to impart a rose colour to the whole area they occupy, the constant flashing of their various tints in the sunlight as they take flight from one position to another adding greatly to the beautiful effect of such a scene.

There was another false alarm of Indians during the afternoon, so that altogether we had a day of

considerable excitement. That night the Government assistant-commissary, an Italian, went mad, and fired a shot from his revolver at the doctor, who had gone to see and prescribe for him. The bullet entered the chest, apparently close to the region of the heart, and, as blood flowed largely from the wound, we were greatly alarmed for the result, the more so as the doctor was very popular with us all. A messenger was immediately dispatched for surgical aid to a fort forty miles off, and in the meantime we did all we could to stop the bleeding and keep up the strength of the patient.

Next morning the doctor had somewhat rallied, and while I was dressing his wound and examining his back to see if any trace of the bullet could be found, I discovered a hard lump under the left shoulder-blade, which was evidently the object of my search. The poor sufferer was most anxious that I should operate upon him at once and extract the bullet; but I feared to do so, although I had on different occasions previously, in my wandering life, had to assume the duties of a surgeon and use the knife. So anxious was he that I should try my skill upon him and remove his unwelcome leaden lodger, that I was obliged to promise compliance with his request if the professional man we had sent for did not arrive before nightfall. It was

an anxious afternoon for me, and many a keen and scrutinising glance did I cast towards that part of the horizon from which the aid we looked for was expected to appear, and well pleased I was to see at last two horsemen galloping towards us, one of whom proved to be a military surgeon who had seen considerable service in the Paraguayan war, and thought as little of extracting a bullet as a chiropodist would of removing an obnoxious corn. Under his hand the missile that had done the harm was quickly cut out, and presented to the patient to preserve as a curiosity if he felt so disposed.

On the second night after the doctor's mishap I was disturbed by some one groaning as if in great pain, and upon investigation found it was one of the men, who said he had been bitten by a snake while asleep. It turned out to be the bite of a tarantula or large spider, from which he soon recovered.

Here for the first time I witnessed the military punishment known as "staking out," which was inflicted upon two soldiers for some act of insubordination. Each culprit was placed flat upon the ground with his face downwards, and his ankles and wrists fastened with wet thongs of raw-hide to stakes driven securely in the ground, in which position he formed a rude imitation of the letter X. According as the thongs which bound him to the

stakes dried they became shorter, stretching the unfortunate victim's legs and arms in a way that must have been exceedingly uncomfortable. If to this be added the extra torture inflicted by mosquitoes and the innumerable other biting and stinging insects which infest the country, it must be admitted that the punishment is one of great severity, especially when continued for a considerable length of time, as it was on this occasion.

While at Media Luna, I held frequent consultations with the military men accompanying the expedition, and, as they expressed themselves to be decidedly of opinion that it would be unsafe to proceed with the surveys with a smaller escort than two hundred soldiers, I caused application for that number to be made to the officer commanding on the frontier; in reply he informed me that the troops at his disposal were so greatly reduced, he was unable to supply the escort asked for, adding that in his opinion from eighty to a hundred men would constitute a force sufficient for our purpose; but even these he expressed his inability to provide, promising, however, to send us fifty men (a promise which was not fulfilled, as only twenty eventually made their appearance).

It is worthy of note that some months before this a body of three hundred and thirty-six soldiers had been sent after a party of invading Indians, against

whom that military force had been able to do little more than hold its own, if one may judge from the accounts published at the time, which showed that, although two if not three engagements were fought upon successive days, the total loss claimed to have been inflicted upon the Indians was put down at eleven killed and one prisoner, besides several said to have been wounded; but, as they had ridden away, they do not appear to have been much the worse for their wounds.

The inference to be drawn is plain, that, if three hundred and thirty-six soldiers could do no more than this, an escort of two hundred for the Trans-andine expedition, crossing the pampas, would certainly not have been excessive, though possibly dangerously small; but an escort of twenty men spoke eloquently as to the value put upon our lives.

At this juncture our circumstances seemed desperate, the authorities having confessed their inability, as before described, to give us even a small portion of the protection admitted to be absolutely necessary. What were we to do? Were we to abandon the expedition which we had come from England to carry out? Were the months of disheartening negotiations, tedious preparations, and all the hardships and privations we had already endured, to end in nothing better than complete collapse? Were we, in fact, to sit down and confess ourselves

beaten while we still felt plenty of strength and courage to meet and overcome whatever difficulties might still await us? Such a termination to the affair would have been most painful and disappointing to the entire staff. I therefore determined to risk everything, and endeavour to accomplish our mission by crossing the pampas in a compact body, keeping along the line of frontier until we got near the *Andes*, and then, bearing southwards, to ascend their eastern slopes, until we could join our colleagues from the Chilian side at the place previously appointed for our meeting. With their assistance we hoped to be able to explore and survey the valleys falling towards the pampas, till the latter were reached, leaving the unfinished portion of the survey on the plains (which, from its level nature, presented no difficulty of construction) to be completed when the Government could arrange for a proper military guard to accompany the party.

Accordingly, news having been brought us on December 6th, that the Indians had recrossed the frontier and disappeared to their own hunting-grounds, we prepared to carry our determination into effect.

A bed was made up in one of the carts for our wounded doctor, who was already rapidly recovering from his injuries. It fared worse with the unfortunate man who shot him. He had been taken

charge of by the military at Media Luna with a view to his being sent to an asylum, but, as we subsequently learnt, died a fortnight afterwards at Fort Lavalle on his way to Buenos Ayres.

Another of the party having fallen ill, the hardships and exciting nature of the life we led being evidently too trying for his nerves, he was allowed to return to Buenos Ayres by the frontier, under the protection of the escort that was to accompany the assistant-commissary.

CHAPTER VII.

MEDIA LUNA TO VILLA MERCEDES.

WE started from Media Luna early on December 7th, and late at night, after making twenty-four miles during the day, reached a small fort called "Verde," having passed two other similar military posts upon the way. There was but little water to be had, and that not of the best quality, being very salt.

These so-called "forts" upon the frontier seem to be of a common pattern. Each consists of a few mud huts with thatched roofs, the enclosure containing them being surrounded by a deep but narrow ditch. The usual strength of the garrison in the case of the smaller ones is from six to ten men; their object is to act as outposts and means of apprising the troops at the larger forts of the movements of the Indians when they cross the frontier; but, as to their being places of real security, a score or two of Indians could easily take any one of them when so disposed. Their best protection lies in the fact that they offer no attraction in the way of plunder

to the red-men, who much prefer the more congenial occupation of sacking the well-stocked homes of the settlers to spending their time on such small game as the occupants of a frontier fort, except when they have a score to settle in the matter of revenge or retaliation for some special injury or loss inflicted on them.

Such were the posts upon the frontier at the time referred to, but no doubt the new arrangements to which I have alluded in a previous chapter, resulting from General Roca's campaign against the Indians in 1879, stand upon a different basis, as it is by no means probable that an officer so thoroughly acquainted with military service on the frontiers would rest content, now that he is President of the republic, and has the power in his hands, with the old system, that furnished a barrier against the inroads of the Indians as worthless for the purpose and as impalpable as those geographical abstractions, a parallel of latitude or a meridian line.

When we had gone about six miles on the 8th December, we met with four small trees, very unusual objects in this part of the pampas, and near to them stood two horses. Thinking that they might have been placed there as a trap to entice us into an ambuscade, a party of us, unslinging our rifles, rode up warily towards them, and discovered that they were settlers' horses, which were probably left

behind by the Indians in their raid in consequence of becoming too tired to travel with sufficient speed. They were already rested, and gave us some trouble and a good deal of galloping before we could capture them.

Eight miles farther on we came across the trail of the Indians. For half-a-mile in width the long grass was beaten down level with the ground by the passage over it, as we subsequently heard, of some twenty thousand head of cattle, which the Indians had driven out a few days previously.

The sufferings of a fine six months' old calf, which lay stretched upon the ground apparently dying from over-fatigue and thirst, awoke the sympathy of a kind-hearted English sailor of our party, who, at once dismounting from his horse, proceeded to pour the contents of his water-bottle down the throat of the dying animal; whereupon he experienced the return which so often takes the place that gratitude should occupy. Young "Taurus," invigorated by the refreshing draught, rose to his legs and immediately began a fierce attack upon his benefactor, who, totally unprepared for such an onslaught, was easily defeated and overthrown, to the great amusement of his comrades looking on.

About a mile beyond the Indian trail we halted at Fort "Diaz," similar to those already described. The soldiers in it told us that the Indians had

passed out at about eleven o'clock in the forenoon quite leisurely along the track we had observed, taking with them the large number of cattle previously mentioned. It was said that about a thousand had been recaptured from them, but I am inclined to think, and the published reports bear me out in this respect, that these were the tired animals that were left behind in consequence of their being unable to travel farther, which were subsequently collected by the soldiers.

An officer who was one of the party sent out in pursuit of the Indians gave us a full account of their proceedings, and spoke with considerable chagrin of the small results they had accomplished owing to the miserable horses on which the soldiers were mounted. As he explained them to us, the tactics adopted by the Indians are: When approaching the frontier with their booty, a certain number of the men having been told off as drivers of the cattle, the rest, constituting the bulk of the invaders, form the fighting contingent. These join the others in helping to drive the cattle past the frontier as quickly as they can be got to go, leaving behind them, as they move along, a trail well marked by weary and dying animals that are unable to keep up the pace.

As soon as the movements of the Indians become known at the nearest fort with a garrison

strong enough to undertake the service, soldiers are sent out in hot pursuit; but, before they come in sight of the marauders, many miles of ground have generally been travelled.

When closely pressed, the fighting Indians leave the care of the cattle to those told off to drive them, and, wheeling rapidly round with lance in hand, charge back in open order on the soldiers, who, according to the military system, at once dismount to receive their enemies on foot, while the latter, galloping around, threaten them on every side, and seldom suffer much for their audacity from the ill-directed fire of the troops.

All at once, upon some given signal, off dart the Indians again in open order, as suddenly as they came, to join their comrades, who have been employing the interval in forcing on the cattle. So rapidly are these movements effected, that, by the time the soldiers have remounted, a distant cloud of dust shows them the length of start their flying foes have gained.

Again pursuit is undertaken, and, a gallop of considerable length bringing them near to the retreating band, once more a repetition of the manœuvre just described takes place.

In a game like this, the Indians, being well supplied with fresh relays of horses, which they can catch and mount at pleasure, have every ad-

vantage over the soldiers, whose inability to continue the pursuit soon leaves them no choice but to return home, collecting the tired cattle they meet with on the way, as evidence of the victory they claim.

From the foregoing description of the manner in which these perpetually recurring encounters are conducted, it is obvious that the advantages on the side of the Indians lie principally in their being better mounted than their adversaries, and fighting on horseback, which gives them greater facility for rapidity of movement; and lastly, they fight as a matter of business, in order to secure their plunder, and are, therefore, thoroughly in earnest in what they are about, while the same cannot always be said of the troops sent out against them, so long as the Government converts the prisoners taken in these raids into unwilling soldiers, or drafts convicted criminals from their gaols into the army to defend the frontiers.

With such materials to command, no wonder the officers, themselves brave, skilful, and energetic soldiers though they be, dare not trust their men to fight on horseback, lest they should escape in the confusion and join the enemy.

A heavy thunderstorm on the evening of the 8th completely wet our beds and blankets, which gave us an uncomfortable night, and produced some illness among the members of the staff.

Next morning we dried our beds and bedding in the sunshine before starting, and then, after a twelve miles' march, reached Fort "Gainza," where we halted for a couple of days.

This was one of the important military posts upon the frontier, having accommodation for three hundred men, in huts built of sun-dried bricks, and thatched with coarse grass.

The only house composed of ordinary bricks was the residence of the colonel, from the flat-tiled roof of which he pointed out to us with pride, the extra precautionary measures he had taken to prevent surprise, by placing a line of wire-fencing outside the ordinary ditch that formed the enclosure where the cavalry horses were kept. But all this fore-thought proved in vain, as we subsequently learned, to our great regret, that the Indians had attacked the place, and succeeded in driving off the horses, leaving the regiment dismounted and helpless.

Our sorrow for this untoward event was heightened by the remembrance of the courteous hospitality we had received while at Fort "Gainza," from the colonel and other officers of the garrison, who entertained us at a dinner that reflected the highest credit on the foraging powers and culinary skill at their command.

The triumph of the banquet was "carne con cuero," a large piece of beef roasted with the hide

on it. This is considered one of the greatest luxuries of the country, and certainly is not a dish to be despised by persons with sound teeth and healthy appetites. As to flavour, it is unexceptionable when you do not chance to get part of the burnt hair into your mouth by mistake, but, on the score of tenderness, I was inclined to think it took a great deal of eating. During the dinner the excellent regimental band played before the door ; and, as we listened to the lively strains of Offenbach's music, it was not easy to realise that we were in an isolated spot on the middle of the pampas of South America.

On the 11th December we resumed our march, the colonel and his staff accompanying us on our way ; but before we had gone far an orderly rode up bearing the news of another Indian invasion, which recalled our military friends to their duties at the fort, whither they returned after exchanging with us a cordial farewell.

We continued our journey, and before long our advance-guard fell back to announce the approach of an Indian coming rapidly towards us ; but, upon spurring on to the rising ground ahead, he was nowhere to be seen. What had become of him was most mysterious. A scout to the left about the same time reported having seen some horses standing in the long grass on the margin of

a lake, while from our right we also heard of the appearance of a horseman.

This combined information indicated pretty clearly that the Indians were not far off, and, as we were crossing an undulating country, we had to proceed with the utmost caution, not knowing at what moment they might come upon us.

About nightfall we found a lake, at which both men and cattle got a most refreshing drink of deliciously sweet and pure water; but we feared to encamp there, knowing that the Indians were in our neighbourhood, and thinking it probable that they might visit the spot during the night for the same purpose as ourselves, which would inevitably precipitate a collision with them,—a matter we were bound in prudence, if not from other motives, to avoid, seeing that our military escort was now reduced to nineteen men. Accordingly, although weary and almost worn out, we pushed on till midnight, when we got to Fort "Dos," having travelled twenty-seven miles from our last camping-ground,—a very long day's journey for the oxen.

It was too late to erect tents, so we slept on the ground at the sheltered side of one of the bullock-carts with a tarpaulin drawn over us. Unfortunately this afforded insufficient protection for all the staff, so that we had to draw lots for the desired cover, which resulted in two of the engineers having

to sleep in the open with the rain beating freely upon them.

In the morning a messenger brought us word that the Indians had crossed our track during the night, information which proved the wisdom of the course we had pursued.

At this encampment we remained all day to rest our tired cattle, while we occupied our time sauntering about and listening to the wonderful stories the soldiers told, of Indian warfare on the frontier.

While examining the ditch which formed the protection of the fort, we saw the body of an Indian lying unburied beside it, and upon inquiry heard the sad particulars of his fate, which might have softened the hearts of his captors were they not hardened by ignorance and the life they lead.

It appeared that the Indian had a friend whose horse was shot, and he himself seriously wounded, in an attack upon some settler's homestead; whereupon his more fortunate companion, instead of seeking safety in flight, took up the injured man upon his horse, determined to risk his own life in the attempt rather than leave his comrade to his certain fate. In this position they were observed by a party of soldiers, who at once gave chase, and easily overtook the Indian's horse, too heavily loaded with its double burden. In the skirmish which

ensued the wounded Indian was dispatched, and his chivalrous companion, overpowered and disarmed, was taken a prisoner to the fort, where, as he refused to give any information about the movements of his people, he was ordered out and shot.

Upon remarking to the soldiers that the Indian must have fought bravely before yielding, as his body was covered with deep gashes. "Oh, no," was the reply; "the men cut him like that to see if he was fat." A suggestion of mine that the body should be buried, was met by laughter on the part of the soldiers, who assured us it was not a Christian body, but only that of an Indian; whereupon, a party of our men were told off to cover it with earth, to the no small astonishment of the warriors, who looked on, greatly amused and somewhat puzzled, at the process. Nor were the ill-fated man's remains even then allowed to rest in peace, as an enterprising amateur naturalist who accompanied our party, arranged with one of the soldiers to dig up the body in the night, and get the Indian's head, with a view to adding it to his interesting collections of specimens. It is possible that I unwittingly suggested this desire by purchasing the Indian's spear myself; for upon expressing my displeasure at the exhumation of the body, when I heard of it, my motive was evidently mistaken for jealousy at the superiority of the head to the spear, considered as trophies, and

the former was sent to me as a peace-offering, but was at once declined.

On December 13th we started at 7 o'clock A.M. and travelled for about nine miles, meeting with occasional small shrubs. On the march I shot a deer, and the officer of the escort captured another (a buck with fine antlers) with the "bolas," which entangled and threw him over. At this point the bullock-carts stuck fast in soft ground, and we had to pass near a chain of salt-water lakes, in one of which I bathed, to the surprise and bewilderment of innumerable wild-fowl, that, judging from the noise they made, seemed to look upon my intrusion with great disfavour. These lakes or lagunas are frequently met with on the pampas, and are the resort of myriads of birds, especially during the winter season : black-necked swans (*Cygnus nigricollis*) and duck-billed swans (*Cygnus anatoides*), the smallest of the family, pure white, with the exception of black tips to the wings (it has been remarked that no entirely white swan is to be found in the southern hemisphere), flamingoes, rose-coloured spoonbills, herons, egrets with their lovely white plumes, a miracle of delicacy and beauty, worthy to deck the head of Titania herself, storks, screamers, ibises, plovers, and wild-ducks of beautiful plumage and great variety, all congregate together, and as the night draws near grow wonderfully active.

Then the deer come down, perhaps to drink (for they are wonderfully fond of salt in every form), or it may be to free themselves from the attacks of flies that harass them on land ; the Biscacha too, after his mid-day sleep, sits by his burrow, blinking at the waning light, as if not yet quite wide awake ; while the partridges, both large and small, leaving the coarse grass cover where they have lain hid, search for their evening meal before retiring to rest ; the whole forming a picture of rare charm, such as only can be seen in Nature's wild retreats.

The greater portion of December 14th was occupied in extricating the bullock-carts from the mire, in which they had sunk deeply the previous day, as they had to be unloaded before they could be moved. After they were got out it was considered desirable to give the cattle a rest (the next stage being a very heavy one of nearly thirty miles, for which distance no water was to be had), it was therefore the morning of December 15th when we were again in motion. Towards breakfast-time we passed Fort "Irrazabal," consisting of about ten huts, built of sun-dried bricks and thatched with grass, all surrounded as usual by ditch and mound ; and garrisoned at the time by between fifty and sixty men. In the centre was a high pole or mast, ascended by means of a rough ladder, on the top of which sat a soldier on the look-out, on a seat moved round at

pleasure by the aid of his feet, enabling him to direct his observation to every part of the horizon in turn. As the heat was great, we halted near the fort for some time, breakfasting there, and afterwards taking a "siesta." At four in the afternoon we proceeded onwards, and, after journeying five miles, came to a small sandhill, alongside of which was a corresponding depression in the ground; Nature no doubt having excavated from it the materials wherewith to form the mound.

The soil, which up to this had been rich and fertile, now became more sandy. We travelled on through the entire night, and halted at five o'clock in the morning. I had to make the journey lying in a cart, being too unwell to sit on horseback; but having breakfasted, and rested till half-past ten, I felt much refreshed, and was able again to get into the saddle and proceed upon our way. About five miles on we came to the dry bed of what appeared to have been a small stream, the first sign of running water we had seen since the expedition left the neighbourhood of Bragado. Soon afterwards we reached a series of small sandhills, the most westwardly of which was hollowed out so that it formed an embankment or mound, about twenty-five feet in height, round a small piece of level ground fringing two ponds of sweet water, on which a flock of wild-ducks were swimming, three of which I shot. Two

large trees were to be seen about a mile to the north, and there were also a good many brambles growing near, suitable for firewood,—a circumstance which inclined us to pitch our tents here for the night. The inmates of a small fort we passed to-day, the interior of which we visited, were suffering fearfully from small-pox, every person in it being, I was told, afflicted with the terrible disease in a greater or less degree. Children in all stages of it were crawling about, apparently without any person to look after them. A heavy thunderstorm came on soon after we encamped, in which some of our tents were blown down and our beds and blankets drenched; and this was followed by another thunderstorm in the night, which finished up the work the other had so well begun, leaving nothing unsaturated in its relentless fury.

After a march of about ten miles on the 18th of December, we arrived at the swampy district known as the "Amarga," where long coarse grass called "paja brava" covers the plain over a large area. Here the Rio Quinto loses itself in the sandy soil, to reappear, as I believe, not far off, under the name of the Salado, which river falls into the river Plate in the Bay of Samborombon, about sixty miles south of Buenos Ayres. Some of us started beating the long grass for game, and were working through it to our own satisfaction (I had bagged three wild-ducks and a brace of large partridge),

when we were recalled to the main party, by signals of alarm. Upon reaching our companions, we learned that a band of Indians were expected to arrive almost immediately in our neighbourhood, to watch for whom a company of soldiers were posted in the hollow of a hill close by. In consequence of this we halted to await the result, and during the night the Indians passed by, at some distance from us.

The following day, shortly after leaving our encampment at the "Medano Amarga," we searched for the Rio Quinto in the long grass, and found its bed, at this place about 200 feet wide, and cut to a depth of five or six feet below the level of the adjoining marsh-lands. The river-course was dry, with the exception of some shallow pools of stagnant water here and there ; the soil was of hard sand, showing ripple-marks, and thickly sprinkled with minute scales of yellow mica, which some of our men supposing to be gold-dust, they were anxious to set about washing for nuggets ; nor was it without some difficulty that we could persuade them they were labouring under a mistake in the matter.

The whole of the day's route lay skirting the Amarga, approximately following the course of the Rio Quinto, upwards. To the south the land was more undulating than heretofore. Shooting as we went along, I managed to get six wild-ducks and one large partridge. To-day we were made aware

of the somewhat startling fact, that our military escort had got no cartridges with them; but we philosophically consoled ourselves for this omission on the part of the proper authorities to supply the soldiers with ammunition, by the reflection that, even if the cartridges had been forthcoming, our safety might not have been materially increased thereby, seeing that the soldiers' fire-arms were more curious than useful.

Brambles were much more numerous along the country we now travelled, and occasional stunted trees were to be seen. At night we halted near Fort "Nichochæa," beside a hollow sandhill, in which there was a pool of water like those previously described.

On December 20th we were early on foot, and after marching some six miles, came to a sandhill, also hollowed out in the centre, where there were some trees and a small lake, as in the other cases mentioned. Here we found the cactus plant growing and also wild-potatoes in bloom. We dug up some of the latter, but found them very small, and rather tasteless when boiled, owing perhaps to their being unripe. For the same reason, no doubt, those we tried to keep for seed, in a wide-mouthed pickle-bottle carefully corked up, were completely spoilt before we returned to civilisation.

There were wild-ducks on the lake, and I tried

to get some of them for dinner, as I always did when such occasions offered, wild-fowl and game being a great improvement on the tough flesh of tired oxen, which we had otherwise to eat. I only succeeded in getting one duck,—not much to be distributed among so many mouths. But I was more fortunate for my collection, as I shot a splendid eagle, which, in the society of a comrade, was no doubt watching the wild-ducks with a hungry eye, waiting the proper time to swoop down upon them from the friendly cover of a neighbouring tree. Its plumage was of a bluish-grey or slate colour on the back and wings, and white on the breast and under part of the body; the legs and toes were yellow, covered with irregular-shaped scales; the tarsi were bare behind, and only clothed with feathers for an inch and a half of their length in front; the lower joint of the leg measured four and three-quarter inches long; the toes were of unequal length and size; of those in front, the inside one was shorter and stronger than that to the outside; all were armed with strong and formidable nails, much curved, and sharpened at the points almost to the condition of a needle; the nail upon the inside or shortest toe was two inches long, that on the middle toe being one and a half inch, while the outside one was one and a quarter inch; these measurements were taken round the outside of the curves;

the nails were rounded on the top, and flat on the sides, with sharp, well-defined edges along the bottom; the middle toe-nail of each foot had a sharp-edged curved groove down the inside, but on the outside, top, and bottom, it was shaped exactly like the rest. The wings were rather rounded, and fell considerably short of the end of the tail. In their ordinary straight flight, which was the only one I saw, the wings were moved slowly and somewhat heavily, as if requiring considerable exertion. The eye was reddish-brown, placed high in the head, imparting to it a severe and sinister expression. These birds hunt in couples, as eagles generally do; and, as far as my experience goes, they are but seldom to be met with on the open pampas, frequenting principally the wooded banks of rivers.

A couple of miles farther on there was another sandhill, encircling, as appeared to be the rule in these cases, a lake, where the water was sweet and good for drinking. We halted beside it for a while, and, after breakfasting, moved on again for ten miles more, making in all eighteen miles got over during the day, which brought us to Fort "Sarmiento," called after the then President of the Argentine Republic. I may mention that the geography of the frontier is somewhat confused by reason of the frequent change of names given to the forts, in honour of prominent public men in

power, whose popularity is often as short-lived as their tenure of office, so that the same fort is frequently known in different places by different names.

“Sarmiento” stands on the right or south bank of the Rio Quinto, and, when we visited it, 250 soldiers were stationed there. The officers of the garrison entertained us very hospitably at supper the evening of our arrival. In the middle of the night we were all aroused by alarming cries proceeding from one of our companions, and, upon rushing to his aid, found him in no real danger, but merely suffering from a hideous nightmare (the result, no doubt, of the too great hospitality of our entertainers), in which he fancied the oxen were disporting themselves in the most absurd manner on his recumbent body, being apparently possessed with the intention of trampling him to death.

Next morning (December 21) we crossed the Rio Quinto at Sarmiento, where it has cut for itself a channel 300 feet wide, through a gravel soil, to a depth of about ten feet below its banks. There were only about two feet of water in the river, nor did it extend across its entire width where we forded it. Immediately above this point the river-course widens considerably. Our route now lay along its northern bank. As we progressed, the land, which at first had been rolling, got gradually

flatter once more. To the south trees became more numerous, until they assumed the appearance of thinly planted woods. By nightfall we had travelled twelve miles, and reached Fort "Doce," where we stopped. We had to lie down to sleep with appetites unsatisfied, as the food provided for our dinner was insufficient; and matters were not improved by a heavy fall of rain during the night completely drenching us, so that we awoke at daylight, wet and stiff, after a night of great discomfort; but to such small inconveniences of travel we had by this time become pretty well accustomed, and could therefore bear them with becoming serenity of mind, trusting that advancing day might give the sun's rays sufficient strength to penetrate and disperse the dull fog that hung around, and shine forth to cheer us on our way. Nor were our hopes misplaced, as bright and warm weather succeeded to the gloom of morning, and scattered the lowering clouds from both our mental and material atmospheres.

While waiting for a start, I had time to look around me, and to sketch the fort under the protection of which we had spent the night.

Three small unfinished sheds, thatched with grass, and partially walled in with sticks interwoven with grass daubed over with a coating of mud, but the greater portion of them left open to the winds of heaven, except where the hide of some horse or ox,

loosely tied up, afforded shelter,—such formed the habitation of the unlucky soldiers whose fate it was to garrison this “fort.” On one side, the river-bank formed its only protection against invasion, while an unimportant ditch surrounded it elsewhere. Within the enclosure, three old blighted trees standing in close proximity, and formed by rude carpentry into what looked more like a primitive hen-roost than a ladder, afforded the necessary post of observation for the sentinel on duty. From the highest point of this ignoble structure floated the country’s flag; while a cannon was posted at the entrance to the fortress to designate its military character, and inspire the red-man’s heart with proper terror of the majesty of constituted authority. Whether the impression thus produced yielded satisfactory results, those most interested alone can tell; but to a casual traveller inclined to speculative habits of thought, the number of crosses to be met with on the frontier, indicating where deeds of violence have had a fatal ending, might suggest the fear that many a wayfarer has fallen a victim to the Indian’s lance, or that respect for law and order has not as yet reached a proper state of development in that locality.

Leaving “Doce” on December 22d, we soon encountered trees, which grew thicker as we went along. Some shrubs with a pretty yellow drooping flower brightened our path. The monotony of the

route was still further broken by the appearance of a mountain, named "El Morro," at some distance to the north, rising from the pampas like an island in mid-ocean. This was the first mountain we had seen since starting, and it proved an object of great interest to the entire party.

After we had gone about eight miles, we were met by Colonel Roca and the commander of the next station (a position of some importance), accompanied by three of the officers of the garrison, who, having noticed our approach, sallied out for a couple of miles, to meet and bid us welcome. After the first greeting, they turned and rode back with us to the fort, near which we encamped. This place rejoices in the peculiar name of "Tres de Febrero" (Third of February), so called from the battle of Monte Caseros, which resulted in the overthrow of the Dictator Rosas.

This curious style of nomenclature is not restricted in its use to military positions. Buenos Ayres itself boasts a square called "The Eleventh of September," to celebrate the downfall of General Urquiza, the successor of Rosas, and a street with the appellation of "Twenty-fifth of May," the anniversary of the Declaration of Independence. I believe I might safely add that there is no town in the entire country which does not possess similar advantages as to names.

Our new-made military acquaintances stopped at

our encampment, and sent for their band, which played to us while we dined.

A large bundle of letters and newspapers reached us here, the first of the latter we had received since starting on the expedition. Those who live permanently within easy reach of postal and telegraphic communication can scarcely understand the great amount of interest and anxiety occasioned by so important an arrival.

And here I may be permitted to pause a little in order to plume myself upon a piece of fulfilled prophecy, that did not seem likely to come to pass when I made the prophetic announcement.

During the short intercourse I had with Colonel Roca, I could not help observing that he was gifted with many high qualities not usually associated together in the same person; and on a couple of occasions, when I was brought into contact with him subsequently, the impression formed at our first meeting was strengthened, so that the idea fixed itself in my mind that he was destined to become the ruler of the country. So strongly did I feel this conviction, that, upon my return from the west coast, when narrating the events of the expedition to my old friends the proprietors and editors of the *Buenos Ayres Standard*, I said I had met with a man during my travels, who would one day be the President of the Argentine Republic—naming

Colonel Roca; a fact of which I have been reminded by them more than once since the prophecy has been fulfilled. I may add that, at the time, so far as I knew, Colonel Roca's name had been in no way mixed up in politics. He has since risen in his profession to be a general, and, as President of the Argentine Republic, now directs with wisdom and firmness the affairs of a prosperous country of vast extent and great fertility of soil.

In referring thus to General Roca, it is but just to the other officers we met with on the expedition, to state that they were, as a body, men of superior intelligence and agreeable manners, personally courageous, and accustomed to a life of hardship on the frontiers—many of them just the type of dashing, energetic soldiers. The non-commissioned officers, too, were men who did their duty with precision, and deserved to be well-spoken of; and although the same may be said of many of the private soldiers, so long as the system of recruiting for the army there adopted remains in force, no truthful historian can bestow indiscriminate praise upon the rank and file.

Next morning we were off early from "Tres de Febrero," and when about a couple of hours on the journey a fatal accident occurred, by which one of the bullock-drivers lost his life. He had presumably been sleeping on the march, on the dangerous seat

formed by the cross-bar at the end of the pole, to which the horns of the hind pair of oxen are attached, and fell to the ground, the cart-wheel passing over him before he could extricate himself. His head was crushed flat, and death must have been instantaneous. We buried his body at the foot of a blighted tree that stood close by, to which we nailed a wooden cross, with the unfortunate man's name and the date of his death painted upon it. This sad duty performed, we continued our course till evening, when, after accomplishing about fifteen miles, we encamped in a beautiful wood on the banks of the Rio Quinto.

Early in the day we had sighted the mountains of San Luis, blue and hazy on the horizon, a considerable distance to the north-west.

On the march I shot five paroquets, five doves, and a pigeon. One of the paroquets had lost all the toes off both its legs, which ended merely in rounded knobs. The injury was not of recent occurrence; but how it was sustained, or in what way the clawless bird still managed to perch upon the trees, remained a mystery incapable of explanation. The doves were about the size of, and in appearance somewhat similar to, turtle-doves. They fly about in large flocks, and are excellent eating. The paroquets, too, are by no means bad in that respect. Were it not for these small additions, our dinner fare to-day would have been but poor and scanty. The

water we had to drink was very salt ; and as I felt far from well, these matters made a greater impression upon me than would otherwise have been the case.

Next day, being the 24th December and Saturday, we determined to remain where we were encamped till the following Monday.

Christmas Day in the southern hemisphere is very different in all respects from what it is to the inhabitants of northern latitudes, where biting frost accompanies its advent, decking the trees with sparkling icicles, and covering the ground with pure white snow. In South America these conditions are reversed, and Christmas Day is conventionally regarded as the hottest in the year.

On this occasion the sun arose with more than usual brilliancy, as if to do extra honour to the festival. Feeling much better for a good night's rest and sleep—not to ignore my obligations to the doctor's treatment—I was up early ; and some of us, taking our rifles with us for protection, went down to the river, the water in which had risen considerably during the night, and there enjoyed a cool and refreshing bath, keeping, while in the water, a sharp look-out towards the opposite bank for Indians, of whom, however, we saw no sign. Nor was our watchfulness unnecessary, as we subsequently heard that immediately upon our leaving that camping-ground the Indians crossed the river there.

After bathing we returned to breakfast with im-

proved appetites ; and as the sun mounted higher in the sky, and poured down his scorching rays upon us till the mercury in the thermometer stood at 104° Fahr. in the shade, we were glad enough to seek shelter from the fierce heat in whatever nook or corner we could find. There was no appearance of Christmas around us except the plum-pudding, brought by a provident member of the staff all the way from England, in a hat-case, to which we endeavoured to do justice when the cooler air of evening had set in, and we, like so many wild animals of the forest, emerged from the lairs in which we had been hiding.

As we sat round that pudding, suffering all the while agonies of torture from the attacks of innumerable mosquitoes, we thought of our friends far off, and wished them all a happy Christmas, spent under more comfortable circumstances than fell to our lot that day. And as to our enemies, I trust we forgave them, and were in peace and Christian charity with all mankind, if not with the insect world.

To paraphrase the song of olden times, those "*gentlemen of England who live at home at ease,*" and spend each happy Christmas surrounded by comforts and luxuries of every kind, know practically but little of the hardships and dangers to which their toiling brethren are exposed, who fight the great battle of life under very different circumstances, helping at the same time to spread the

name and influence of England, not only over that conventional realm upon which "the sun never sets," but also in other and foreign lands.

For my part, during a life of more than average wanderings, I have spent Christmas under very varied circumstances,—on shipboard in the North Atlantic in a gale of wind; in the tropical ocean in a calm, with the rain falling in torrents and soaking through the decks till bed and bedding were saturated with wet; in the backwoods of Canada, with snow for my bed, while the thermometer registered 69° Fahr. below the freezing-point; without food of any kind except salt pork, and not even enough of that; in South America, as I have described, almost eaten up by mosquitoes, and what was left of me scorched by a burning sun. With such experiences in my own case, and knowing well how very much worse must be the lot of many another traveller; when the Christmas season comes, let it find me where it may, there is always present in my mind a kindly thought for those abroad, and "those at sea."

As to this particular Christmas Day upon the Pampas, while it passed away the clouds wept bitterly, perhaps pitying, but certainly not improving, our plight; so that we had to wait till nearly noon the following day to dry our tents and bedding before starting. When we did move, a farther distance of fourteen miles brought us to the Villa Mercedes.

CHAPTER VIII.

VILLA MERCEDES—SAN LUIS.

THE Villa Mercedes, also known as "Fort Constitucion" (nor are these the only names it possesses, having a less distinguished title, as the "Pass of the Fleas"), is the principal military station we met with, and the head-quarters of the general commanding on the frontier. It is situate on the north bank of the Rio Quinto, which here runs in a valley it has formed for itself, 1270 yards wide and about fifteen feet deep, 890 yards of this width being cut still five feet deeper. When we were there, the actual stream opposite Mercedes was only about seventy to eighty yards across, and its depth not more than a couple of feet; but, in addition to this, a considerable quantity of water was drawn off from the river higher up, and taken by means of a canal to supply the town and irrigate the adjacent land.

In the neighbourhood are many paddocks sur-

rounded by strong stockades, where horses and cattle are securely kept, or wheat, maize, and other crops are cultivated; while a belt some two miles wide of beautiful forest-trees, chiefly of the kind called caldene, with very minute foliage, fringes the river on either side.

In the woods adjoining Mercedes we encamped upon a lovely piece of green sward free from all under-brush; but there were some drawbacks to the natural beauties of the place, as we soon found to our discomfort that venomous insects swarmed in the trees around us. During the daytime, hornets of amazing size and ferocity haunted our tents in such countless numbers that we dreaded them even more than the scorpions and tarantulas, whose visits, if equally unceremonious, were less frequent; while at night mosquitoes came on duty, and drove sleep from our eyelids with their sanguinary song, which they poured into our unwilling ears in spiteful monotony, with a persistency and energy worthy of a better cause.

The hornets, however, constituted our greatest plague, and we were beginning to despair of being able to rid ourselves of the nuisance, when we discovered their abodes hanging in numerous clusters or hives, like brown paper bags, from the branches of the trees under which our tents were pitched. The measures to be adopted towards these turbulent

belligerents were at once decided upon, and a surprise prepared for them. As soon as the wretched insects had retired to their rest for the night, we opened a vigorous fire upon their nests with blank cartridge, dispersing them into space, somewhat after the manner adopted towards the ringleaders among the Sepoys during the Indian Mutiny. The attack proved completely successful, and procured us an immunity from hornets in any great numbers for the remainder of the time we spent at that encampment.

But all the insects were not venomous, and some of them were both harmless and beautiful. There were the fireflies, for example, Nature's living diamonds, that flitted about or rested among the leaves in the darkness of the sultry nights, as if lighting up the woods for a fairy-ball. Some of these charming little insects I turned to a use, that, as far as my knowledge goes, was novel. Each evening I collected about half-a-dozen fireflies, and placing them under an inverted tumbler upon the tent table, sufficient air for their consumption being admitted by placing a small piece of paper or stick under the edge of the tumbler to tilt it up, we found that they formed a capital night-light, enabling us to see around the tent—dimly, it is true, but with sufficient clearness to read the dial of a watch. In the morning they were let off duty and liberated,

to be replaced the following evening by another set. I have not patented the idea, and it may even be a good suggestion to some enterprising individual in the night-light or lucifer-match business, in search of a name and trade-mark for his wares. The "safety firefly night-lights, or matches" would sound well, and probably realise a fortune for the happy patentee; in which case I hope he will remember the source from which the suggestion emanated.

The morning after our arrival we were visited by General Arredondo and his staff. In the course of conversation he told us there was no water to be had for a length of 150 miles along our route—information the importance of which our previous experience enabled us fully to appreciate.

Much that we heard on that occasion left no room for doubt as to our mission being most unpopular with the national authorities, who would gladly have suppressed it if they could, without giving rise to complications they were desirous to avoid, and would have heard with little sorrow of its failure and collapse. As the matter stood, our orders were that we should here change the oxen for mules, the latter being said to be more suitable for the rest of our journey. The change had to be effected through the Government contractors, and caused much disheartening delay; for "red tape" in South America

is as strong and resistless in its powers of binding with inextricable folds, as were the serpents of old that strangled Laocoön and his sons. Our patience was once more put to the test, as we waited for the necessary change to be effected.

Upon the morning of New Year's Day we were aroused from our slumbers by the pleasant sounds of music, the General having courteously sent out a military band to serenade us; and later on some of the officers of the garrison came to breakfast with us, from whom we heard whatever news was going.

While waiting at Mercedes, a tribe of friendly Indians arrived upon the opposite side of the river and encamped there. They were a hardy-looking race, low of stature, but broad-shouldered and stout-framed. Their hair was coarse and straight, and black in colour. In the case of the women it was plaited in long braids behind; but the men, who also wore it tolerably long, kept it from falling over the eyes and interfering with the vision by a narrow fillet or ribbon, bound round the forehead and temples. No hair is allowed to grow upon the men's faces except a very narrow fringe or moustache upon the upper lip; all the rest, being considered superfluous and unbecoming, is pulled out by small silver tweezers, which every Indian carries about with him, as constituting, with the clothes he wears,

all that is necessary to complete his toilette. On foot the Indian moves about with an awkward, shambling gait; but, once on horseback, he is quite at home, and sits as firmly and securely as if he formed part of the animal he rides. No circus acrobat could surpass the ease and activity with which he manages his steed, and changes his position to meet the exigencies of the moment.

Calupan, the chief of these friendly Indians, who had come into our neighbourhood, rode over, with a dozen of the *élite* of his followers, to see us, and I may here take the opportunity of introducing him formally to my readers.

He belonged to the tribe of Baigorrita, who was the son of the well-known warrior Yanquetruz; and as there is a certain amount of complication and confusion about the names of these "braves," I had better explain the correct state of the case before going on.

Colonel Baigorria, when a very young officer in the Argentine army, considering himself slighted by some act of the dictator, Rosas, transferred his services to the Indians, whom he joined, living for twenty years among them, and accompanying them in many of their raids.

He became a bosom friend and adviser of Yanquetruz, the chief, and they mutually agreed to do honour to this friendship by calling their eldest

sons after each other. Hence Yanquetruz's heir came by the name of Baigorrita (or Little Baigorria); but whether the other party to the compact kept his engagement or not I am unable to say; for although I met him, and spoke about all sorts of other matters, in a family concern of the kind one would not like to be too inquisitive.

I invited Calupan himself to my tent, but it would have been wiser to have entertained him in the open air, as he was not quite so clean or particular about his clothes and person as one could have wished. The full extent of this, however, I did not learn till my guest had left.

Having, through an interpreter, made suitable remarks upon the brotherhood and equality of all mankind in general, and of white men and Indians in particular, I proceeded to brew for him a skilful beverage, vulgarly called a "brandy cocktail," which I may inform the uninitiated in such matters consisted in this case of brandy, water, sugar, and the juice of bitter oranges (some of our Spanish friends know the mysterious compound under the name of "Cocktail Transandino"), the whole beaten to a froth by working a perforated hollow conical plunger in a cylindrical cup, with conical bottom.

The foaming drink was handed to Calupan, who accepted the proffered bowl willingly enough, but, whether from Indian courtesy or caution, declined

to put it to his lips till I had set him the example by tasting some of it.

This done, and after he had poured out upon the ground a small portion of the liquid, presumably as a libation to his gods, he drank off the rest with infinite relish, and held out the cup at once for more, intimating his opinion that I was, if possible, rather better than a brother. This process he repeated so frequently, that I judged it expedient, for fear of compromising his sobriety, to alter the proportions of the ingredients in the festive beverage, till at last the intoxicating element had altogether disappeared,—a process of elimination by no means pleasing to my guest, so that he politely, but firmly, declined all further offers of liquid hospitality, until struck with amazement at the working of one of our Abyssinian tube-pumps, the clear flowing stream from which he first regarded as having been called up by magic, when, upon receiving our assurances that such was not the case, he and his friends further indulged in copious draughts of sparkling water, with apparently as much avidity as if they had tasted nothing in the way of drink for days before.

Among the curiosities we had to show the Indians were our Westley Richards breech-loading

rifles, and to their accuracy of fire and capabilities for rapidity of discharging we particularly drew their attention, hoping that a magnified account of the knowledge thus acquired would be imparted to others of their race less willing to acknowledge our relationship, and render us perhaps not so liable to be attacked by them during the remainder of our journey through their territory.

At the end of the interview, Calupan was dismissed with suitable presents of tobacco, having before he went sworn eternal friendship to white men one and all, but more especially to us individually, whom he particularly distinguished as his "loving brothers,"—an honour, of which I hope we were duly sensible.

Before taking their leave, we received a pressing invitation to visit the Indian encampment on the opposite side of the river, which we did a few days afterwards. Perhaps we should have sent beforehand, announcing our intention to return their call, but we omitted this formality, and probably in consequence saw our new brothers at home, to disadvantage.

Calupan we could not find, and, in the absence of the chief, there was no one left to do the honours for him, as the community at large seemed to be rejoicing in various stages of intoxication. One votary of Bacchus we observed whose only

clothing was an empty gin-bottle, which he clutched lovingly in his sleep, as a child does its favourite doll.

In some places, where sobriety was beginning to reassert her authority, dinners of roast mare's flesh were being prepared; and standing by an equine carcase, which had just been skinned, and was then in the process of being cut up, was a very good-looking young Indian woman eating, with evident relish, a piece of raw liver, from which she disengaged two fine rows of very regular white teeth to smile at us in wonder, as we rode past.

Having purchased some ponchos of Indian manufacture, which we afterwards took the precaution of boiling, to make sure that they were clean before admitting them into use, we returned to our tents, not very favourably impressed, I fear, with the "noble savage."

The weariness of our delay at the Villa Mercedes was rendered all the more irksome by the great heat of the weather, the thermometer having on different occasions marked as high as from 106° to 107° Fahr. in the shade, at half-past four o'clock in the afternoon. Strange to say, some nights immediately preceding these hot days were intensely cold, on one occasion the temperature falling as low as 34° Fahr., or only two degrees above freezing-point.

Our principal occupation when the sun was not too hot was shooting in the woods along the river-bank. This served the double purpose of beguiling time and furnishing us very often with more palatable food than the regulation tough ox. The aggregate of my own shooting on these occasions is comprised in the following list:—75 pigeons and 2 doves, 5 wild-ducks, 5 large partridges of a kind we had not previously met with (*Endromia Elegans*), 3 small partridges (*Nothura Maculosa*), 2 plover, 1 bandurria, 1 black vulture.

The pigeons were somewhat smaller than the English wood-quests, and without the white ring round the neck that distinguishes the latter. The doves, like those previously described, resembled turtle-doves in size, and were of a fawn colour. The large partridges were, as mentioned, of a kind new to me, being nearly the size of grouse, and also rather darker in colour than an English partridge; the primary wing-feathers were mottled with brown spots corresponding to the rest of the plumage, while a small pointed crest or tuft of feathers projects from the back of the head. Their flight is undulating, up and down, unlike the continuous steady course upon the wing of both the other kinds of partridge I have already described as being met with. There is also a great contrast in the colour of the eggs, those of the *Endromia Elegans* being

a bright yellowish-green, instead of chocolate-colour, as in the case of both the other partridges. The length of the egg is two inches, and its largest diameter one and a half inch, being also uniform in shape at both ends.

The bandurria (*mandurria* or *curucau* of Azara) is a bird in shape much resembling a curlew magnified to nearly the size of a turkey, as it stands about eighteen inches high. The plumage of the back and wings is mottled grey like that of a goose; the primary wing-feathers are whitish and the tail black; the lower part of the body dark, approaching black; top of the head brown, neck yellowish, breast inclining to reddish-brown, bill black. The flesh is excellent, but the bird is difficult to get at, being exceedingly wary and watchful (a character which belongs to the curlews also).

On other occasions I have seen bandurrias with plumage somewhat different from that here described. I am inclined to think they belonged to a distinct family, as the entire flock seemed to be alike; but possibly they may have been all males, or all females, just as the chaffinches separate in the winter season. The last bird in the list, the black vulture, is the same as that described as having been met with in Entre Ríos. Near Mercedes we also saw blue eagles, of which mention has been already made; caranchos (*Polyborus Braziliensis*), too, were very numerous,

but this was always the case wherever I have been throughout La Plata.

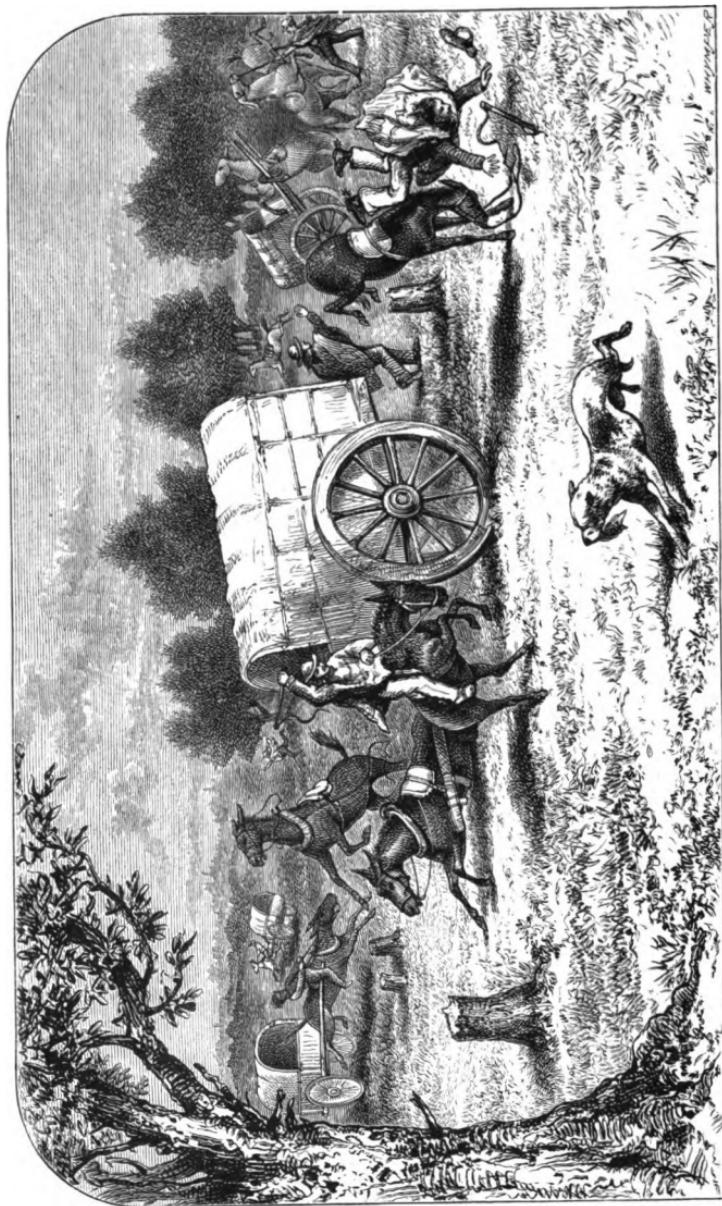
There were some very pretty little birds that flitted through the woods ; one had a crimson head and body, with brown wings ; another was white, with black feathers on its wings ; both were about the size of sparrows.

Scissor-tailed birds were also common here ; they were not unlike large swallows as to their bodies, but had long projecting feathers from their tails, somewhat resembling a pair of scissors, to which singular appearance they owe their name.

It is remarkable what little use the natives make of their faculties of observation regarding birds, and very frequent attempts to obtain information from them concerning the name of some peculiar bird we saw were always met by a vague reply to the effect, "It is a white bird," or a red, or blue one, as the case might be,—facts of which my eyes had already sufficiently apprised me. This peculiarity is all the more singular, as in matters concerning horses and cattle, the thoroughness and sharpness of their observations are most remarkable. The probable explanation is that they do not consider birds to be objects of much interest, but, the management of horses and cattle constituting the daily occupation of their lives, every minute circumstance connected with these animals is carefully noted and recollected.

I should mention that during our stay at Villa Mercedes the General and officers of the garrison very courteously invited us all to a ball, which, however, I was unable to attend, but the rest of the staff went, and enjoyed themselves greatly at it.

The means of transport supplied us at Villa Mercedes were altogether insufficient for our wants, so that we had to leave behind everything that could possibly be done without. The Government Enfield rifles and their ammunition, several barrels of salt beef, a number of planks and boards, were among the articles abandoned. With baggage thus reduced, an attempt was made upon the 22d of January to make a new start upon the expedition, but fortune did not smile upon us. The mules, sent to take the place of the bullocks, proved very wild and hard to manage. No sooner were they got into the harness, which they would not suffer to be put upon them until blindfolded by a poncho thrown over their heads, than they broke away from the men holding them, and kicked themselves free from all their trammels. While this was going on, a state of the wildest confusion reigned on every side ; but keenly as I felt the annoyance of these hindrances to our progress, I could not resist the comical phase of the ineffectual efforts of the drivers to restrain their unruly animals, so that I sat down and sketched the operations, which I have designated “A Bad Start.”



A BAD START.

Runaway riderless mules were to be seen galloping off into space, while their quondam jockeys picked themselves up and limped along rubbing their abrasions, Spanish anathemas falling from their angry lips, of such a dreadful nature that the fugitive quadrupeds would have stood still and shuddered had they understood their import. Some of the mules, less fortunate, had got entangled in the harness, and hung dangling from the shafts of upturned carts in every stage of strangulation. The net result was that our attempted start proved unsuccessful, and we had to remain two days longer where we were to repair damages, and make the necessary preparation for another trial.

Early upon January 24th we tried once more to start upon our journey, and this time with somewhat more encouraging results, for, after great exertions, we succeeded in getting two miles forward, though not without mishap, as one man was injured, two carts upset, and the iron shoeing knocked off a wheel, not to mention some other casualties of minor importance. The disabled man had been thrown from the saddle, and his head meeting the ground first, a considerable-sized patch of hair was rubbed off the scalp. He was insensible for a while, but gradually recovered, although it was not till some days afterwards the symptoms of concussion of the brain completely disappeared. Here again a delay of two days was necessary to get our carts put right.

During this interval, one of the drivers, an Italian, having been detected in stealing a watch from a comrade, was sent off to gaol, the law having been set in motion by a very simple process, without the intervention of such complicated legal proceedings as one is accustomed to see made use of in like cases elsewhere. The criminal law, in its preliminary stages, is beautifully simple in the South American republics, but I cannot say my admiration extends to its working in the carrying out of sentences, in which respect it seems to be "more honoured in the breach than the observance;" but I think we, in these British Islands, might occasionally take a useful hint in some respects connected with criminal proceedings from our Rio de la Plata friends. I remember once being much struck with the very efficacious treatment of a pickpocket, taken in the act of theft at athletic sports in Monte Video. The culprit was bound hand and foot to the entrance gate-post, in which position he was seen and closely observed by all persons coming to and going from the grounds, and I think the number of people who could recognise and shun him afterwards must have been considerably increased on that occasion, so much so that the additional undesirable notoriety, thus acquired, would very likely cause him to change the scene of his operations to some other town, after his term of imprisonment was over.

To return to our encampment two miles beyond Mercedes. A soldier of the escort having been guilty of insubordination, was bound hand and foot with his rifle passed over his arms and beneath his knees, as once before described. Nor was the punishment thus inflicted sufficient to restore his respect for discipline, as, smarting under his disgrace, he poured out a volley of abuse against his officer, threatening to murder him upon the first opportunity favourable for the purpose,—an outburst of temper he would have been wiser to control, for, instead of bringing him relief, it caused an addition to his punishment, as he was then gagged, by a bayonet inserted cross-ways in his mouth like a horse's bit, and fastened behind his neck by a leather thong, so that he had no further opportunity of publicly declaring the schemes of vengeance he contemplated indulging in when set free.

January 27th.—We managed to advance five miles to a ford of the Rio Quinto, where we proposed to cross it. Even this short journey had not been accomplished without great difficulty and exertion, the mules continuing to give much trouble, and two carts having completely broken down. We rested on the north bank of the river the whole of next day, which was Sunday, hoping to be able to start early on Monday, and, after fording the river, to push forward a considerable distance to our next intended

camping-ground. Towards nightfall the chief of the transport service came to inform me that it would be impossible to proceed as we contemplated doing in the morning, with the means of conveyance at his disposal. Matters had gone very badly with us of late ; no sooner had one obstacle been overcome than a greater one took its place, to be in its turn followed by another, and another, in what appeared to be an interminable series ; but this new one was the worst of all we had yet met with, and threatened to bring the expedition to a disastrous and untimely end, as we had ascertained that any further assistance from the authorities was not to be obtained. It was impossible to resist the conviction that something more than the mere chapter of accidents was at work to thwart us, and, as I listened to the unwelcome news, I felt very much in the frame of mind that the camel must experience, when being loaded with the proverbial "last straw." My courage, if not my back, was at that moment very nearly broken. The officer could give me no hope, his opinion being that the expedition must be given up and abandoned. I tried him in every way that I could think of, but "no es posible" (it is not possible) was the substance of his replies, as, even if our mule-carts had only half-loads upon them, he thought the result would be extremely doubtful. Upon getting this negative admission that, under such circumstances, success

might not be absolutely beyond our reach, I took my line of action at once, and gave orders to leave behind about one-half our baggage, notwithstanding the great and general hardship and inconvenience such an arrangement would entail upon us; but our case was desperate, and needed a desperate remedy. This being done, we again attempted to move on with our carts lightened, and having, after great difficulty, crossed the Rio Quinto, we proceeded for about three miles farther and then encamped for the night, sending the animals back to the river to drink.

Next morning we were up at three o'clock in order to have time to cross, by a forced march, a district understood to be devoid of water; but the obstinacy of the mules and the difficulty of harnessing them—at least such was the excuse—caused so great delay that it was eight o'clock before an onward movement could be made (five hours having been spent in getting ready).

The country we travelled through was more undulating than any we had previously met with. Some places were covered with thin scattered woods, others again were clear and open, with only a tree of stunted growth occurring at distant intervals. All through the day, when the horizon was visible, the mountains of San Luis to the west could be distinctly seen. It was nine o'clock at night before we halted,

after a march of considerable length, broken only by a short rest at noon. We lay down to sleep in the open, without tents to cover us, as there was no time to fetch them, and I wanted to have as little as possible to embarrass me in the morning or to delay our starting.

January 31st.—We resumed our march, but had scarcely gone three miles when the mules gave up, and it was necessary to halt in order to let them rest.

The day being intensely hot, it was five o'clock in the afternoon before we could get off again; but once started, I determined to continue the march all through the night. My hopes in this respect proved to be but shortlived. Darkness had scarcely fallen upon us when the officer in charge of the transport came up, and informed me that the mules could proceed no farther, although we had made but very little progress during the day,—the Government commissary, who accompanied him, adding he had just received a special message, sent in reply to our entreaties for assistance, to say that none could be sent us from San Luis, there being neither carts nor mules to be had there. This was a climax to all my fears, as the breakdown could not possibly have occurred at a worse place, the only water to be had being almost a full day's march behind us. View it as we might, the

disaster seemed to be complete and crushing, and the fate of the Transandine expedition doomed beyond hope, as our only chance had rested on getting over this portion of the journey by forced marches, men and cattle bearing the thirst and other privations as they best could.

In this state of perplexing difficulty I determined to make one supreme effort to burst through the meshes of the network of obstacles, which grew greater at every step we took. I decided to ride to San Luis, some forty miles off, and see whether I could not, by personal means and influence, obtain the assistance which Government officials failed to procure for us. Three members of the staff volunteered to accompany me, and, this arranged, we dismounted where we were, and, each tying the reins of his horse's bridle to his wrist to prevent the animals straying, we rolled our ponchos round us and lay down upon the ground to sleep for a couple of hours, until there should be light enough to enable us to see our way.

No sooner had the moon made her appearance clear above the plain at midnight, than we were up again, and, mounting our horses, which had faithfully stood guard over us during our hasty and uneasy slumbers, we rode up to the encampment about a mile ahead of where we had lain down, and then, drinking off some hot coffee which had

very thoughtfully been got ready by the cook, we started for San Luis, a party of five, including the guide.

A ride upon the Pampas of a fine moonlight night may not appear to the reader to entail any considerable hardship, but there were unpleasant contingencies that had to be taken into account in the matter. There was the possibility, at any moment, of falling in with roving bands of hostile Indians, or, even worse, the "Ganchos malos," or outlaws, who infest some portions of the country, especially the neighbourhood in question, and none of these were altogether pleasant to reflect on.

Listening to stories of hair-breadth escapes and sudden deaths (of which, unfortunately, the frontier history affords many an example), we endeavoured to beguile the time as we rode along, trying to drive off sleep, which grew more pressing in its demands for satisfaction as the morning dawned, till, at last, quite worn out, I had to yield myself a victim to its influences, and, twisting my fingers in the horse's mane, I laid my head and shoulder on his neck. In this uncomfortable position I snatched a precarious sleep, awakened from time to time by a start or stumble over some hidden obstacle in the grass or inequality of the ground.

This painfully lethargic fit gave way before the bright rays of the morning sun, which showed us we

were skirting a beautiful range of mountains, three miles beyond which lay San Luis.

These mountains, in their geological aspect, consist principally of gneiss, mica-schist, and quartz, and are said to be rich in mineral ores, of which gold, silver, lead, and copper are the principal, considerable mining operations being carried on at different places among them.

CHAPTER IX.

SAN LUIS TO MENDOZA.

UPON arriving at San Luis, our first act was to endeavour to see the Government contractor, and ascertain the extent, if any, to which we might depend upon him for assistance; but in this respect I was not very sanguine of success, he having already refused the written request sent to him with the same object. His answer to my personal application was that the help asked for could not possibly be given.

I had now tried every official source of aid within my reach, and they had completely failed me on the most critical occasions. I therefore set about seeing whether I could, with my own private credit and personal exertions, retrieve the apparently lost fortunes of the expedition. Upon ascertaining that I was really in earnest in the matter and determined not to be beaten, and that I intended purchasing on my own account all the mules obtainable in San Luis, of which I soon found there was a sufficient number to be had, the Government contractor modi-

fied his previously expressed opinion, and discovered that, after all, he could supply our wants. The result was that fifty-three pack-mules were immediately provided, with which additional means of transport I felt myself master of the situation, and able to carry the expedition through to its legitimate termination, if permitted to do so. This in itself was no mean victory to have achieved ; but I could not calculate with certainty upon success, as no one could say at what moment some new official obstacle might not be placed before us.

Assistance was at once sent back to our companions, and, while waiting for them to come up, we occupied ourselves in making preparations for the continuance of the expedition.

San Luis is an old-fashioned place, laid out somewhat irregularly, an unusual circumstance in a country where the towns are almost universally built with streets crossing each other at right angles, at equidistant intervals.

There are some moderately good houses, but the habitations generally are constructed of sun-dried bricks, and thatched with coarse grass, the roof in many cases being covered with a coating of gravelly mud, a custom which, I think, was probably originally adopted less for the purpose of making the roof more water-tight than as a protection against the firebrands of Indian enemies. The Government

House is very unpretending, as is also the principal plaza or square, which lies in the centre of the town. In it stands a very old church, with its wooden belfry supported by a massive colonnade, suggestive of the days of the Jesuits, now long past.

On the outskirts there are the usual "quintas" or suburban residences, each enclosed in its own garden by walls built of large regularly-formed blocks of dried mud or earth. Some few old well-built brick houses, with sloping roofs of tiles, still remain as mementoes of the original Spanish settlers. The soil consists principally of sand and gravel, in which poplars, willows, and fig-trees, especially the latter, grow luxuriantly.

The morning after our arrival we rode out early to bathe in a running stream upon the outskirts of the town; and, as we came back refreshed, it was a pleasant sight to see the neatly dressed women and children wending their way to church (the day was Friday), carrying with them small mats or rugs to kneel on at their devotions, just as the Turkish women do when going to service in the mosques of Constantinople. There was, in fact, a strange resemblance to an Eastern town in this quaint old place. The women here have a habit when walking in the streets of covering their faces, all but the upper part, with one end of their shawls thrown over the shoulder in an artistic manner, combining

the effects of apparent carelessness with real precision; while the fig-trees, mud huts, and walls, combined with the general air of stagnation and rank weeds which pervade the place, all tend to strengthen the Eastern illusion, and make up a picture worthy of the country of the Sultan.

Such was the San Luis that I saw; somewhat different, it is true, from that described in a little book that has fallen into my hands, in one of the illustrations to which, the hero of the tale, dressed in the costume of a Central American settler, never worn in La Plata, and mounted on the battlement of massive masonry walls (built by the artist's pencil), hurls, from this easily erected vantage-ground, defiance at an interesting group of hostile Indians clothed in picturesque habiliments that would admirably suit performers in a circus, but far beyond the reach of the most ambitious Indian of the Pampas.

The open woods that fringe the Rio Quinto change, too, their character under the author's pen, and grow into a tangled forest of the tropics, inhabited by monkeys that must feel strange and homesick among such unaccustomed scenes, so far transported from their native haunts.

The rest of our party having arrived upon Saturday, the 3d of February, and our new arrangements being completed, we started with fresh energy and

confidence upon the following Monday morning, *en route* for Mendoza. After a march of eighteen miles we halted for the night; but as the mule-carts with our tents and luggage did not come up till very late, we slept in the open air, and were awake again and on foot early next morning, travelling fifteen miles before breakfast, and in the evening eight miles more. The surface of the country we travelled over was undulating and the soil sandy; few large trees were to be seen, but there was a growth of brushwood or shrubs, principally algarroba.

At this point the small military escort that had hitherto accompanied the party left us in obedience to orders received by them from head-quarters. We again slept in the open air in order to save the time required for pitching and striking tents.

The only water to be had at these places is the rain, collected in tanks or reservoirs formed by earth embankments thrown across the valleys,—the fortunate possessors of which deposits dispose of the precious element at high prices to travellers who require it for their mules and cattle. In one of these tanks we bathed, and experienced a curious, and not altogether agreeable sensation, which sent us quickly back to dry land, where we discovered a fine crop of hungry leeches clinging to our legs and bodies in the most tenacious manner, and seeming

by no means inclined to relinquish, of their own accord, their interesting occupation.

On February 7th, after travelling five miles through a loose, white, sandy soil that was very trying to the mules and horses, and where the frequent carcases of oxen lying about testified to the severity of this portion of the road on horned cattle, we came to a salt-water river called the "Desaguadero," which forms the boundary between the provinces of San Luis and Mendoza. Spanning it stood a most extraordinary piece of engineering work in the form of a wooden bridge, the parts of which, instead of being framed and nailed together, were only fastened by tyings of raw hide. The whole was in such a dilapidated and rickety condition that it was altogether useless for the purpose for which it was originally erected.

Fortunately, the water at the time being very low, and the bed of the river as well as its banks consisting of indurated clay, we were able to ford it without much difficulty ; and, after proceeding nine miles farther, we came to a post-house where there was a well in which the water stood at a depth of fifty feet below the surface. Here our mules and oxen got a drink, greatly to their satisfaction after the long march through burning sand.

We breakfasted here, and afterwards went on some nineteen miles farther, making a very long

march of thirty-three miles during the day. The whole distance, except the last league or two where water flowed along the side ditches, had been most distressing. The pack-mules were obliged to stop some five or six miles short of this, being unable to proceed farther, having suffered greatly from the excessive heat and the sandy nature of the soil, into which they sank deeply.

The house that tempted us to seek shelter for the night under the protection of its hospitable roof had much to recommend it. Shaded among poplar and willow trees, it looked very comfortable and enticing, with a good garden, well stocked with peaches and quinces, while large bunches of ripe grapes hung from the vines in tempting profusion. A pleasant stream of running water passed close by, affording us a cooling and refreshing bath, which we enjoyed most heartily before sitting down to supper, there being few more agreeable things than a plunge into cold water after a long and fatiguing ride through a sandy desert, under the scorching heat of the sun. The place had its drawbacks, too, as we soon found out upon retiring to our beds, hoping to enjoy a peaceful night's rest —hopes, alas! that proved provokingly illusory. Scarcely were the lights extinguished when innumerable "binchucas" (insects combining the size of a black beetle with more than a mosquito's love

of blood), of the existence of which in our neighbourhood we were quite unaware, swarmed in upon us, and began their sanguinary banquet in the most voracious manner, putting all thoughts of sleep utterly out of the question.

Many a time that weary night did we bemoan our plight, tired almost to the verge of endurance, and not allowed to sleep. Often did we strike a light and begin a furious assault upon our aggressors ; but, kill as many as we would, the process seemed only to increase the number of survivors, apparently more venomous and hungry than those that had gone before, till at last we gave up all thought or hope of defending ourselves any longer against the binchucas' repeated attacks, until the light of day dispersed them to their mysterious habitations, and our infinite relief.

February 8th.—We advanced twenty-six miles to-day, the soil along our route being sandy and barren. At night we slept upon the ground in the open air. If our rest upon the previous night was marred by binchucas, here we had hornets of enormous size and brilliant colour, to occupy our attention. One I killed, measured $1\frac{1}{4}$ inches long, and the length of its sting was one-third of an inch. The body was purple, and wings red, with yellow and black shading round the edges of the latter ; but the beauty of the marking would go a short way

towards reconciling one to the length of the sting, if unfortunate enough to feel its power. It was well for us they were night-sleepers like ourselves, and consequently we suffered little inconvenience from them.

Eighteen miles was the extent of our next day's journey, through a barren and miserable country. Nothing worthy of note occurred, except a severe dust-storm, which darkened the sky and spread gloom on every side, making, at the same time, the air so thick and full of dust that breathing it was most oppressive.

Our pack-mules had fallen far behind, and the Government contractor arriving with more from Mendoza, sent fifty of them to help the party onwards, which gave them great assistance.

Here we met with a blackbird very like the English feathered songster its namesake, not only in appearance, but also in the noise it made when startled; and while travelling in the province of Mendoza I frequently heard the blackbird's song, or one so like it that I could not detect any difference between them; but I never succeeded in identifying the singer with the bird above referred to.

February 10th.—We started at half-past four o'clock this morning. The weather for the last two days had been thick and foggy, but now grew clear and bright as daylight advanced, and the

Andes in all their grandeur for the first time met our delighted gaze, inspiring us with new energy for fresh exertions, so that we travelled nearly forty miles that day. The fact of the thick atmosphere having prevented our seeing the mountains a couple of days sooner, as we might have done had it been clear weather, added to the effect produced by the first sight of them, in consequence of our being between forty and fifty miles closer than the point at which they are usually first seen.

We slept that night upon the ground, under the verandah of a post-house, where an amusing incident occurred. A vivacious traveller we met with, mistaking us for our companions from the west coast, informed us that the Pampas party had come to an untimely end and was broken up in consequence of the chief of it having gone mad, and shot the doctor. This announcement was all the more amusing, being directly communicated to the doctor himself, who, upon endeavouring to establish his identity, and correct the story in some of its sensational details, found the task a difficult and thankless one, as the narrator expressed strong doubts about the matter, and evidently much preferred his own account of it, to the less florid, but more correct one, given by the doctor, so that the latter was generally voted to be an impostor, who, as one of the party put it, if he was really the person he represented himself to be,

ought to be dead and buried. I subsequently heard another version of the same affair, in Chili, which I was told had gone the rounds of the papers. In it, while the principal characters in the tragedy remained the same, the motive of my supposed attack upon the doctor was charitably attributed to *delirium tremens*, and many a hearty laugh had my good friend the doctor and I over the various accounts we heard of our imaginary quarrel.

I may here mention that the worthy doctor recovered perfectly from the wound inflicted by the commissary, at Media Luna, and, when I last saw him, a couple of years afterwards, was well and hearty.

The next day we rode on towards Mendoza. As we approached the town, the soil, hitherto consisting principally of sand, became coarser and more gravelly, being composed of the detritus washed down from the mountains; and those of us who were mounted on horses soon felt the change, in the limping gait of the animals we rode, as unshod horses, which ours were, cannot stand a stony or gravelly road nearly so well as mules can. Here the results of irrigation, to which much attention is paid, began to be apparent, and the country, consisting naturally of a poor and unfertile soil, is made, by means of water carried to it, exceedingly productive.

After a ride of about fifteen miles, we crossed the

rough bed of a mountain torrent, and found ourselves in the city of Mendoza.

The Governor received me very kindly upon my arrival, and took much interest in our affairs, promising to afford us all the aid he could.

Dr. Day, an English resident of long standing in the place, also showed us much civility, and furnished a great deal of useful information. And we were not a little surprised to find one of the companions of the first part of our journey, an interpreter who had accompanied the expedition as far as the Villa Mercedes, but left it there, established at Mendoza as Government engineer. He kindly acted as our guide, telling and showing us all that was interesting and curious about the place, and giving us every assistance in his power.

At this point a colleague, who had hitherto shared with us the fortunes of the expedition, was obliged to leave and go over the Uspallata pass to Chili, for the purpose of returning to England on private business. He left his comrades with regret, and they on their part were loth to lose him.

Turning now to the place itself, the tragic fate of which has placed its name upon the page of history, among the sad roll of buried cities, destroyed by an earthquake as sudden as it was complete in the terrible effect produced, what shall I say of Mendoza, or which city shall I describe?—that of

the living, or of the dead? for the two lie side by side, linked together by a strange and mystical bond of union. It is sad and solemnising to turn from the happy scenes where peaceful people follow the occupations of their daily life, and look upon these ruined habitations, under the fallen walls of which were crushed the ill-fated victims of one of those terrible convulsions of nature, which happily are little understood in favoured England.

The 20th of March 1861 had been a sultry and oppressive day, and, as the night approached, the half-suffocated inhabitants of Mendoza, issuing from their houses, went in search of cooler air, or sat at their open doors to catch each breath that passed, while the more devout among them assembled in the churches to offer up their evening prayer, when, without a note of warning, a terrible destruction swept over the devoted place. The earth shook and opened in yawning chasms; foundations tottered and houses fell, burying beneath them nearly the whole of the population. In less time than it has taken to describe all was over, and from 12,000 to 15,000 people had perished in the ruins, which still exist as records of the dire calamity, and tell, with a force that words could not express, how terribly complete it was.*

* "That first awful space of ten seconds sufficed for perfect ruin. Nothing was left standing, not a house, not a wall, not even a stone fence for twenty leagues about the city.

Scarcely was the earthquake over, when fires broke out in different places among the débris of fallen houses, and raged for many days before they could be extinguished. Nature had done almost her worst, but it was reserved for man to add the last touch of darkest shadow to a picture already full of misery. With a cruelty and inhumanity scarcely to be credited, bands of plunderers from other places rushed to the scene, as vultures to a carcase, and occupied themselves with endeavouring to secure what spoil they could, instead of helping the few still surviving but imprisoned sufferers to escape from their living tombs ere the consuming flames had reached them.

After the catastrophe the Government tried to induce the scanty remnant of the population to abandon the site of the ill-fated city, and begin the building of a new one at some distance from it; but associations proved stronger than the teachings of experience, and a new Mendoza has arisen alongside the ruins of her unfortunate predecessor, evolved from a state of chaos and confusion into one of beauty and prosperity.

Fine public buildings, private dwellings that indicate comfort and convenience, gardens with their fruitful vines and fig-trees, walnut-trees, and

"The loss may be estimated at 13,000.

"No more than 2000 escaped."—*All the Year Round*, February 1, 1862, No. 145, p. 444.

poplars, both Lombardy and Carolina, grace the public streets and walks ; but above all, the pleasant promenade, more than half a mile in length, with its streams of running water flowing on both sides, beneath the canopy of shade afforded by two double rows of well-grown trees. Add to this the mountain torrent which rolls past Mendoza along its bed of rounded stones and gravel, from the mighty Cordillera, whose slopes reach almost to the city.

All these combined to make a lovely spot, but, in spite of this, it is impossible to divest the mind of the sad memories connected with the locality.

Your host, while he entertains you, recounts the hairbreadth escape he had himself, while many members of his family perished. The coachman, driving through the town, tells similar dismal tales of friends he lost, and points to particular spots among the ruins where some exceptionally appalling incident occurred ; while the hairdresser, not to be outdone, as he cuts your hair, pauses at intervals to tell, with the garrulity of his calling, more horrors of that dreadful day.

With such surroundings, it is not surprising that numerous precautions should be taken, to guard against the possible recurrence of a similar calamity. The new streets have been laid out much wider than the old ones were, and the walls of houses

are generally composed of a timber framework, filled in with sun-dried bricks.

The people, too, live in a state of continual apprehension, as may be seen from their using, instead of doors, heavy curtains drawn across the entrances to their bedrooms, so that upon the first alarm of an earthquake, they may spring from their beds and rush into the open courtyard, with which each house is usually provided.

While at Mendoza, we went about and saw as much of the neighbourhood as we could. On one of our excursions we came upon a rift or opening in the ground, a trace left by the great earthquake, which was terribly suggestive of the sad event.

Fruit was very abundant and cheap. When we called at the hair-cutter's, he was unable to attend us at the moment, being engaged upon another "patient," but sent us in a decanter of Mendoza wine and a basket of grapes, wherewith to occupy ourselves while waiting for him to operate upon us with his scissors.

Whether it was this courteous treatment or the luxury of the shampooing process during the hot weather that influenced us, I cannot take upon me to assert positively; but what I do know is, that we went to him to have our heads washed and shampooed nearly every day while at Mendoza.

We visited some primitive baths about three miles distant, formed by an enclosure of grass matting stretched between poles, which latter supported a covering of thatch to protect the bathers from the sun's excessive heat. The water flowed rapidly through the bath, and was intensely cold, the source from which it came being the melting snow among the mountains. Some people said that bathing in it was dangerous on this account, but we enjoyed it greatly, and experienced no injurious effects.

Afterwards we went to the refreshment-house kept by the owner of the baths, and regaled ourselves on grapes and peaches *ad libitum*, with a bottle of the beer of the country to wash them down, and a tumbler full of Mendoza wine to the coachman (there were three of us besides him); the total charge for our baths and the refreshments we had partaken of amounting to the wonderfully small sum of about fifteen pence of our money. Certainly travellers and tourists have not yet spoilt Mendoza in the matter of charges, but perhaps a wholesome dread of earthquakes has partly prevented them doing so.

The professor of mathematics at the college was an Englishman, who showed us every attention. The chair of chemistry was filled by a German, and a Frenchman, who was of our party, and left

us there, subsequently obtained the professorship of the French language at the college, so that foreigners have no right to complain of not being properly appreciated or represented at Mendoza.

An Englishman whom we were obliged to leave behind us ill, became, I afterwards learned, actively employed in the manufacture of some article of trade, which was to pass for English to the consumers. I hope that particular branch of industry in England did not suffer from the repute the spurious goods procured it. Possibly not, as one frequently hears from natives who deal largely in counterfeited goods, that the imitation in the case in which they happen themselves to be concerned is preferable to the genuine article.

As far as my own experience goes, I think I may safely say, without fear of contradiction, that great liberties are often taken in La Plata with the names of Bass and Guinness, as I am confident that I have frequently had ale and stout supplied to me, in bottles bearing unimpeachable trademarks, the contents of which, however, had never come from either Burton-on-Trent or Dublin, and would have done little credit to either place.

Imitation may be the sincerest form of flattery, but most eminent manufacturers would no doubt prefer not to have their vanity soothed in this manner at the expense of their business.

A little to the north-west of Mendoza lies the Uspallata pass of the Andes, the summit of which is about 12,795 feet above the level of the sea. It is by this route that nearly all regular communication between Chili and La Plata is kept up, it being the principal highway connecting the two countries, although there are several other passes through the Cordilleras. Near the Uspallata stands the majestic Aconcagua, whose summit, 23,910 feet high, is covered with perpetual snow, defying the sun's rays even in that hot latitude.

It is by this pass that those enterprising gentlemen, Messrs. Clark of Valparaiso, propose to carry a railway across the Andes, to connect Santiago and Mendoza. They have been for years maturing their plans, and have made most careful surveys of the route.

The project is one of much interest to engineers, owing to the great height of the watershed to be crossed, taken in connection with the very steep inclination of the western, or Chilian slopes of the Andes, necessitating the adoption of gradients, curves, and other works of an exceptional character.*

* For particulars of this railway, see article in Appendix, upon "Argentine Railways."

CHAPTER X.

*AMONG THE ANDES—MENDOZA TO THE VALLEY
OF LAS LLENAS AMARILLAS.*

WE left Mendoza on the 17th February, having previously taken leave of the Governor of the province, and the kind friends who had contributed to our comfort and amusement during our six days' sojourn among them. But scarcely had our advanced post gone a couple of miles beyond the outskirts of the town, when the mule-drivers refused to proceed farther, and unloading their animals, coolly prepared to encamp for the night, being evidently unwilling to quit the pleasant quarters they had been in of late till both their money and their credit were exhausted. Leaving some of my companions to take charge of the mutineers and prevent them returning to Mendoza, I rode back in search of the Government commissary, who had not come up; and, finding him at Mendoza, I brought him with me, in order that he might at once pay off and dismiss the two most troublesome of the muleteers, for having in a contumacious manner refused to obey

orders. By the time we returned to the party, they had got a distance of about twelve miles from Mendoza, the recusant drivers, changing their minds when they saw me off, having loaded up again and proceeded on their journey.

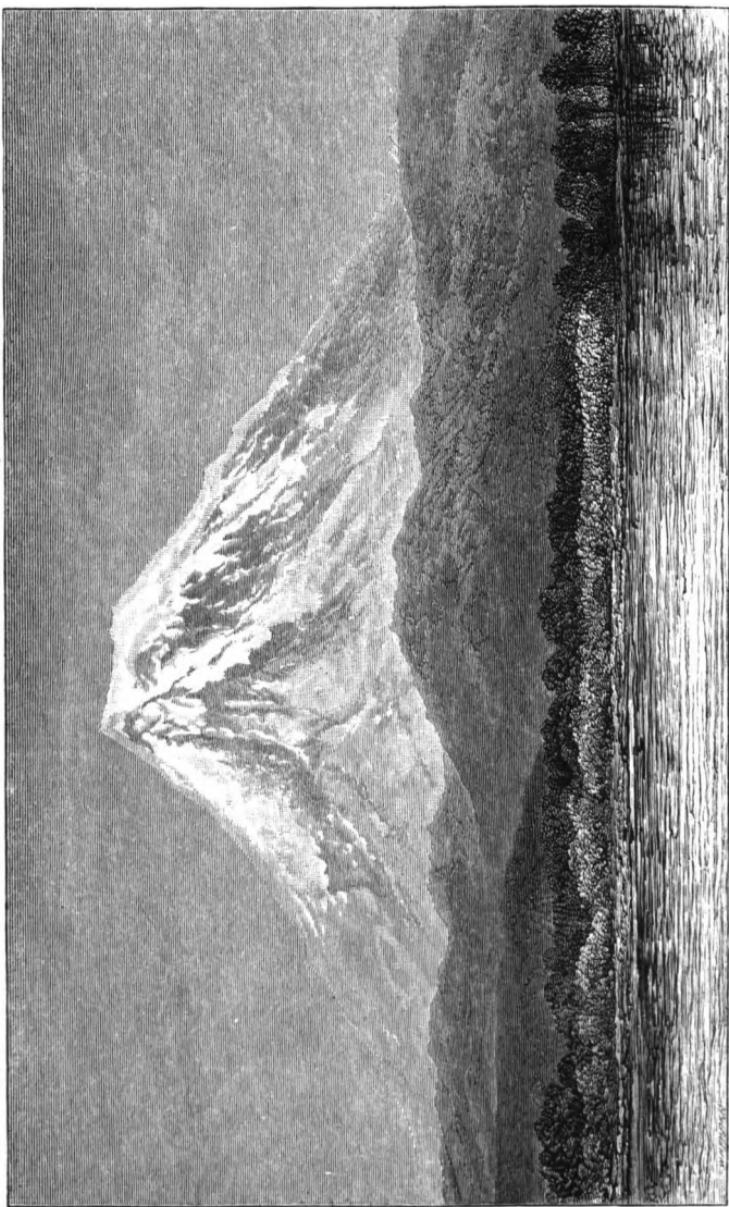
I was a good deal annoyed to find that a favourite horse of mine had been disposed of at Mendoza. Another, my private property, had previously been appropriated by the Government commissary and given away at Mercedes ; and what made this the more irritating was, that the divided responsibility in these matters rendered it impossible to get any satisfaction about them. For although the party was nominally under my orders and control, still, whenever anything was done that I disapproved of, I was always informed by the Government officials that they were acting in accordance with superior orders.

The place where we halted for the night was called Lujan, on the banks of a rapid river, the course of which appears at this point to be almost parallel with the line of the Cordillera. Poplar and other trees grew along the banks, and a patch or two of darker foliage stood out upon the mountain slopes, which elsewhere looked bare and devoid of vegetation. The Andes here seem to consist of three separate and parallel systems, with valleys lying between them, which at intervals find egress

towards the lower country. Their slopes are rugged and broken up irregularly by rain or frost or other atmospheric causes, but nowhere are any signs of stratification visible among them.

On our next day's march, after going about three miles, we sighted a low ridge of sandy hills to the eastward of us. The soil of the mountain slope along which we travelled was composed of sand and gravel, and a few miles farther on all signs of irrigation and cultivation ended, and we came to an unfertile sandy district, with low brushwood growing on it. At about thirty miles south of Mendoza we reached a place where water and pasture were to be had, and, it being the last of either we were likely to meet with for a considerable distance, we halted for the night, and slept in the open air, or rather tried to sleep, not being very successful in our endeavours, in consequence of mosquitoes abounding beyond all possibility of description, and setting to work with as much energy as if they were fully aware how seldom a treat of the kind came in their way, and were determined to make the most of it while it lasted. One wonders what these tormenting little insects usually live upon in such desolate places, where animal life but seldom makes its appearance. Do they take to a vegetable diet under compulsion? If so, it appears to me that they bite all the harder for it afterwards.

Under such circumstances as I have described it was easy to be early risers, and we were up and stirring before the night had fairly passed away. But the scene which met our tired eyes was one of such magnificence and grandeur as soon dispelled all weariness, and filled us with wonder and amazement. There stood the Andes boldly outlined against the sky, with the mighty "Tupungato", towering like a giant above the other peaks, its snow-clad summit bathed in gold by the sun's first rays (itself not yet apparent over the horizon), while rosy clouds alternating with crimson and violet of deepest hue, brought out the lights and shades upon the rugged mountain-tops, and all below was merged in one vast sea of sombre grey, night's mantle, which the sleeping earth had not yet put aside. Each moment did the picture alter, and every change brought with it some fresh beauty not before perceived, till the sun, rising from the Pampas as from the ocean, covered the mountains with a dazzling light, in which the delicate tints and shades of colour disappeared, and last of all the darkness at their base resolved itself into a thin blue cloud like smoke, which hung about them for a while, and then too, was in turn forced to yield and vanish as the rest had done. It was impossible to look on such a scene unmoved, or to find words wherewith to reproduce it to another's eye. Gladly would



TUPUNGATO, FROM THE RIVER LUJAN.

we have lingered gazing at the view before us, but business, demanding our attention, recalled us to more practical affairs. It was necessary that we should be off without delay; a long and weary journey lying before us. That day we travelled six-and-thirty miles, three-fourths of the distance being over a barren sandy soil, destitute alike of grass and water. The day was very hot, and during it all our dogs, which for many months had followed the fortunes of the expedition, disappeared; where they had gone to no one knew, but it was thought that possibly they had sought shelter from the scorching heat under some thick shrubs we passed upon the route, and never afterwards had been able to overtake or find us; or when the cold of night came on, they may have retraced their steps back on the route we took that morning and joined their lot with the first settler they fell in with. Whatever was their fate, we deeply regretted to have lost our faithful followers and friends.

During the march we saw a number of condors, the great vultures of the Andes, and I shot four of them with my rifle. They were all nearly of the same size, and measured eight feet across the expanded wings. A ruff of soft white feathers like swan's-down adorned the back and sides of the neck. The general colour of the plumage is black, but some of the covering feathers of the wings are of a whitish

grey. The beak is very strong and powerful, and well fitted for tearing up the carrion which constitutes the food of its possessor. The claws are comparatively short and blunt, and evidently not intended by nature for carrying off prey, as the eagle does, although there appear to be many well-authenticated accounts of condors having done so.

Numbers of these birds are to be seen among the Andes, soaring at great heights, with no apparent motion of their wings, but sweeping round and round in circles, carefully examining each speck upon the ground below them, in the hopes of discovering materials for a repast. Should anything attractive meet their eye, closing their wings, they rapidly descend to a lower stratum of the air, to scan the object of their search from a nearer point of view. Taking advantage of their curiosity in this respect, one of my companions shot four of them upon the wing one morning. The plan he adopted was to lie motionless upon the ground, with face turned upwards towards the sky, until a prying and unsuspecting condor came down to see if the recumbent body was likely to provide it with a meal, trusting itself too rashly within the bullet's range, and paying for its temerity with its life.

The same experimenter had proved this *ruse* (with the slight alteration of kicking his legs in the air while lying on his back) to be equally successful

in attracting the attention of unwary ostriches, whose bump of curiosity seems to be abnormally developed.

The power of scenting out their food from afar, with which condors are proverbially credited, is, I think, over-estimated, as the keenness of their sight may in some degree account for their discovering a carcase at a distance. When lying on the ground among the mountains, I have frequently scrutinised the sky with searching gaze, and seldom without discovering numbers of condors, soaring about at such a height as scarcely to be visible to the naked eye. No doubt they keep a sharp look-out upon each other, and when one of them swoops downwards to inspect something remarkable below, his movement is quickly observed by others, that close in around, to watch the result with anxiety ; and if a savoury carcase should reward the search, the finder's chance of enjoying it alone is small, as comrades soon drop down to share the banquet. So that it may be to a keen sight more than to their sense of smell, that condors and others of the vulture family owe their great success as foragers.

We passed some settlers' houses to-day, and were hospitably received by the inmates. One of the women took down a guitar and sang to us while we sat and drank the milk they gave us, verses in our honour, part of the composition being a musical

regret of her inability to refer to us by name, being ignorant of our proper appellations.

There was a clear running stream close to where we encamped, in which we bathed, but did not remain long in the water owing to the presence of leeches, one of them having fastened itself securely on the doctor's foot, attracted, no doubt, by some inward sympathy for a fellow-member of the profession.

Here I again had a good opportunity of observing a blackbird of the kind previously described. It was exceedingly like the English one, the only slight difference I could detect being that the bill of the former was red rather than yellow; but the manner in which both birds call out when startled and put to flight, is exactly alike.

We slept under the verandah of an outhouse, and were glad of its protection, as a heavy thunderstorm came on during the night. The owner of the house told us of a man not far off who was lying almost at death's door, from the result of knife-wounds he had received in a fight with another Gaucho some short time before. In the morning the doctor, true to the instincts of his healing art, went off to see the wounded man, and I accompanied him on his errand. We found the poor fellow alive, but scarcely able to speak from weakness. He had been stabbed all over the upper part of his body, in such a manner

that it appeared marvellous how some of the wounds had not proved fatal. The doctor considered them all to have passed the dangerous stage, and that the extreme weakness, produced by loss of blood and the suffering the wounded man had undergone, alone was to be feared ; and, ordering that he should have the most nourishing food to be obtained, left the invalid brightened up and encouraged with the hope that he would soon be well again.

The terrible and frequent use of the knife, one of which (much larger than a carver) every Gaucho carries about with him stuck in his belt, is one of the greatest curses of the country.

A friend of mine, a sheep-farmer in the province of Buenos Ayres, told me that, two of his workmen having fallen out one evening in his house about some trivial matter, one stabbed the other to the heart. The murderer then deliberately dragged the dying man by the hair of the head outside the door, coolly remarking that he should be sorry to stain the gentleman's floor with blood.

Another friend told me about a somewhat similar scene in Uruguay, of which he was an unwilling spectator, where a man had a knife driven through him from his back till the blade projected several inches from his breast ; and all because he had the bad taste to differ on some political question from the man who killed him.

In this instance the wounded man with his last breath called upon the people around him to bear witness that he died as became a man, in support of his opinions, while the aggressor, unable to withdraw his weapon from the wound he had inflicted, quietly surrendered himself to an officer of justice, who came up just then, with a careless grace, as if he were but an actor on the mimic stage, who had slain his antagonist with a pasteboard blade, to meet him again before the footlights in some other character.

During the march upon the 20th of February we crossed four small rivers, in the last of which, at San Carlos, we bathed, and heard it contained fish in abundance. We afterwards dined at the small inn, having encamped in the suburbs, after travelling twenty miles during the day. Some of our pack-mules had lagged so far behind that they did not arrive for a couple of days, and I was not sorry for it, as I became very ill, and was obliged to lie up. Unfortunately the medicine-chest was with the rearmost of our party, and we had to wait until a messenger who was dispatched for it returned, when the doctor managed with the aid of chlorodyne and mustard-plasters, to bring me round again; and I was sufficiently recovered after a couple of days' rest, when the last of the loiterers came up, to go forward with them.

Upon February 23d we moved on again, and soon left the small settlement around San Carlos behind us. After travelling thirty miles we came to a farmhouse, where the owner would neither give us water to drink nor sell us milk or eggs, nor even permit us to encamp near his place. The only satisfaction we could get from him on any point was the information that a league farther on there was another house, where we should find all we required and much more. Accordingly some of us rode forward; but, although we must have gone three times the distance he had said, not a trace of a house of any kind was to be seen, and we were obliged to return to our companions, whom we found encamped a couple of miles from the inhospitable farmhouse, which in reality proved to be the last occupied habitation to be met with until we had crossed the borders and descended into Chili.

To my great surprise and annoyance I here saw that the worst of the mutinous muleteers who had been dismissed at Mendoza, was still with the party, and upon demanding an explanation, the answer I received was that it had been found impossible to procure another mule-driver at Mendoza to take his place, and consequently the dismissed man had been re-engaged without my knowledge, and notwithstanding my positive orders to the contrary.

As we were already very short of drivers, I

thought it best to pass the matter over. This unsatisfactory arrangement was the more objectionable, because, in addition to its setting aside my authority, it placed me in a very uncomfortable position, compelling me to be always on my guard, as the man in question had openly vowed vengeance against me, and looked quite capable of keeping his word in that respect. At night I could sleep but little, and that very lightly; and on several occasions, upon awaking with the noise of footsteps near my bed, I invariably found it was this same muleteer, who seemed always in search of some missing friend or comrade in the most unlikely place to find him—at least that was the ready excuse upon his lips when challenged.

Having partaken of dinner on the evening of the 23rd, for which, as an invalid, I was allowed two eggs, while my companions had to be content with the less delicate fare of dried beef, we lay down to rest; but the rain poured heavily upon us, soaking our blankets and beating on our faces in large cold drops, with such persistency as to make sleep under the circumstances impossible, in my case at least, until by hoisting the fragments of an old umbrella I obtained the wished-for shelter for my face.

In the morning it was discovered that one of our men was missing, and that fifteen mules had strayed during the night. The latter were found after a

lengthened search, but no trace of the missing man was met with.

The rain continued all morning; and, as it was late before we could start, owing to the above-mentioned causes, we were unable to make much progress during the day.

When we had ridden about seven miles, we descended, with much difficulty, into a deep and broad valley, which we crossed. Here the underlying soil consisted nearly altogether of débris of pumice-stone covered with sand, and down the middle of the depression there ran a small stream that must at some former time have been much more important than at present, to judge by the valley it had excavated.

We journeyed on until we had gone about twenty-three miles, and then halted after dark, upon the banks of a stream along the borders of which some good grass was found growing. This was an important discovery, as the country we had traversed was very destitute of pasturage.

From San Carlos southwards, the Andes appear very rugged for a length of about thirty miles; but there they throw out a slight spur towards the Pampas, and the slopes become more rounded and less steep, the main ridge turning rather westwards in an opposite direction.

February 25th.—We rose wet and stiff after a

night of drenching rain that had saturated our blankets and the rest of our clothing. During the day we marched over fifteen miles, crossing another deep valley, and encamped in a third, through which runs a small stream, the weather continuing wet and dreary. A large deposit of basalt formed the crest of an eminence lying to the south of our camping-ground, while all along the hillsides to the north was to be seen an almost horizontal bed of fine volcanic-ash about fifteen feet thick, and at a height of some two hundred feet above the level of the valley in which we were, and where we met with numerous boulders of very fine close-grained granite of a grey colour.

During the succeeding night there was a regular stampede among the mules, occasioned no doubt by some prowling puma, attracted to the vicinity by the scent of our supper of roast-meat; and considerable difficulty was experienced in preventing their escaping in the dark. Nor were we quite successful in this respect, as, when dawn appeared, twenty of the mules were nowhere to be found. Men were sent out to look for them, and the rest of the party proceeded on their journey.

At about three miles from our halting-place of last night we came to a valley called "Curraizalito," the descent into which being very steep, was our first real experience of mountain travelling. One



DESCENT INTO THE VALLEY OF CURRAIZALITO.

young mule, perhaps smarting from the way its pack was loaded, or anxious to show its contempt for the dangers of the route, which it evidently did not sufficiently appreciate, flung up its heels as it was nearing the bottom of the slope, when the weight of the load overbalanced it, sending the mule rolling over into the valley below. Upon being extricated from its burden, the animal arose uninjured, and stood patiently to have its pack put on again, and never afterwards exhibited a taste for unbecoming levity in dangerous positions.

About twelve miles farther on we reached the pass or ford of the "Rio Diamante," where it flows through a cutting about three hundred yards wide and from ninety to one hundred feet in depth, worked out by the action of the water through soft red sandstone rock, interspersed with beds of shale of similar material, and overlain by gravel.

The river at the time we saw it was very low, its width being only about forty yards and the depth such that it was just a question whether or not the mules could cross it without swimming—no easy task, the current being very rapid. The manner of crossing was this:—A man mounted on the mare that always led the troop (a bell being strapped round her neck to guide the others) tried the ford, riding through the water to the opposite side, where he kept up a constant tinkling of the

bell, which the mules were accustomed to follow ; this immediately attracted them, and one by one they plunged boldly in, and crossed over to their "Madrina," as she is called. It was a moment of some anxiety while we watched the progress of those that bore our beds and blankets upon their backs. The mule that carried mine, stumbled and fell in mid-river, and was immediately swept away, struggling in the stream, to a projecting point below, where, recovering its feet, it succeeded in gaining the shore, but not before my *impedimenta* had become completely wet—not a pleasant prospect for a cold night among the mountains.

Shortly after fording the river we came abreast of the beautiful mountain called the "Cerrito Diamante," an extinct volcano rising abruptly from the plain, but close to the foot of the Andes. As in the case of volcanoes generally, the mouth of its crater is somewhat broken down on the western side where the liquid lava burst through the chal-dron, and flowed down to the plain in streams, the course of which is still distinctly visible. Passing on, we continued marching for a distance of nine miles from the river, and then encamped at a height of about 3000 feet above the sea. It was a bitterly cold night, so that sleeping in wet bed-clothes, as fell to my lot on that, and on many another occasion, was anything but comfortable.

On the morning of the 27th we were astir before daylight, and some of us climbed to the top of a neighbouring height to see the sun rise above the Pampas. At first the view was very indistinct. To the left stood the isolated Cerrito Diamante, still shrouded in the gloom of night, while dimly visible on the south-eastern horizon was the outline of the Cerro Nevado, darkness lingering over the intervening plain; but as the sun rose the scene was changed as by some fairy's magic wand, and all that before was dark and indistinct became clear and glowing in the morning light, disclosing a panorama of great beauty.

Descending from our place of observation, we were soon mounted upon the mules and riding southwards.

For a distance of sixteen miles no water was met with, until some rocks were discovered in the cavities of which rain had collected. There we halted for breakfast. Close by was found the carcase of a puma not long dead, and farther on we met, for the first time, with guanacos (or wild Llamas), several flocks of which we saw, getting some distant shots at them, and killing one, which fell to the rifle of one of my companions. The full-grown guanaco stands about three feet six inches high, measured at the shoulder, and has a long slender neck. The body is woolly and ragged-

looking, the upper part being a light reddish-brown, and white below, while the head is nearly mouse-colour. The sole of the foot is of a spongy texture, enabling the animal to skip from rock to rock along the mountain-side like a chamois, without slipping. Guanacos' skins form an article of clothing for the Patagonian and Pampas Indians, greatly prized by them, and they manufacture the wool into ponchos of considerable value on account of their good wearing and waterproof qualities. The flesh is not held in much esteem by the Indians so long as that of horses can be obtained, this latter being their favourite food.

For our own part, we found a roast prepared from the guanaco shot to-day, apart from any question of toughness, which was only natural in the case of meat so recently killed, was rather strong-flavoured, and not very good for eating, while, on the other hand, soup made from it was pronounced unanimously to be excellent.

At a distance of thirty miles south of the river Diamante our route passed by a natural object of considerable interest,—a stream, or rather rill, of yellowish-white fluid like petroleum, issuing from the mountain-side at a considerable height, and trickling down the slope till lost in the porous soil of the valley below. The source from which it flowed was at the junction where a hard metamorphic rock

interspersed with small crystals of augite overlay a stratum of volcanic tuff. It was formed like the crater of a volcano, and full of black bituminous matter, hot and sticky, which could be stirred up to the depth of about eighteen inches. Floundering in it was a polecat or skunk (*Mephitis varians*), having been enticed to its fate by the desire of securing a bird caught in the natural bird-lime, till a bullet from the revolver of one of the party terminated the skunk's struggles to extricate itself from the warm and adhesive bath in which it was hopelessly held captive.

The overflow from this fountain was, as described, like a stream of petroleum two or three feet wide trickling over a bed of pitch or some such substance, which extended to a much greater width along the edge of the running stream at its contact with it; this material was of a very sticky nature, becoming gradually harder as it spread farther out, assuming the appearance of asphalt when it became mingled with the loose sand of the adjoining soil.

While engaged in examining this natural curiosity we came upon two small birds, caught in the sticky substance at the edge of the stream; they were still alive, but upon releasing them, both the feathers and the skin came off where they had been in contact with the bituminous matter, so that we had to kill them to put an end to their

sufferings. No doubt they had been taken in by the appearance of water which the stream presented and had alighted to drink, when they discovered their mistake too late. Their fate suggested the idea that in a district so devoid of water others of the feathered tribes must constantly become victims to the same delusion in a similar manner, and upon a close inspection of the margin of the stream, the correctness of this inference was established by the discovery of numerous skeletons of birds imbedded in it; nor were those of small quadrupeds unrepresented, among which we recognised the remains of a fox. The sense of smell possessed by animals of this kind being generally so acute, I am disposed to think that they were not deceived as to the stream being water, but had approached it with the intention of capturing the fluttering birds, and were caught themselves in like manner as we had seen in the case of the skunk.

After travelling about five miles more, the doctor reported one of the men to have been taken very ill and unable to proceed farther; we were therefore obliged to halt for the night at a very inconvenient spot near a stream of hot water flowing from the mountain-side.

Next morning we were up before daylight, and, as the invalid was better and able to be moved, we were anxious to push on; but the difficulty of

getting the packs loaded up, short-handed as we were, occasioned great delay in starting. We had also to send men to search for mules that had strayed during the night, only some of which were eventually recovered.

About seven miles from our camping-ground we reached the river Atuel, up the course of which we had to ride for a couple of miles before finding a practicable ford. When we did make the attempt, it was as much as the mules could do to cross it without swimming, but eventually all got safely over, with no greater inconvenience than getting some of our luggage wet.

On the way we had seen the ruins of a rancho or hut which an adventurous pioneer of civilisation had erected, with a view of trying to establish himself in this advanced position, but, being attacked by the Indians, as we were told, he had abandoned his post and returned whence he came.

After leaving the Atuel we passed some mountains composed of sandstone, and soon afterwards met with limestone, the stratification in each case being inclined at an angle of about 45° to the horizontal ; the bearing of the dip was eastwards, that is, towards the plains, indicating upheaval by the igneous rocks below, which latter we came upon farther on, forming extinct volcanoes. One of these had sent forth several successive streams of

lava, marking, where its waves had cooled and hardened, rough contour lines like steps of rugged stairs upon its lower slopes, and blocking up the original course of Rio Salado with an impenetrable dam, which forced the river to cut for itself another passage through rock of softer substance.

While marching forward we saw some very large flocks of guanacos.

In passing by the jagged peak of an extinct volcano, I saw, perched upon a projecting fragment of rock, what I took to be a chinchilla, but having shot it with my rifle, the natives pronounced it to be a "rock biscacha." Its fur was very long and fine like that of the chinchilla, both in texture and colour.

Towards nightfall we encamped close to the Rio Salado, after having got over twenty-five miles during the day.

February 29th.—We were up at dawn, and took levels along the river's edge to ascertain its rate of fall, which here proved to average about one foot in 135, leading to the hope that possibly by this route might be found a means of egress for the railway, from the mountains to the plains below. Accordingly we pushed onwards up the valley, abounding with fine scenery. At one point of it the mountain-tops stood out against the sky sharp and distinct in the clear atmosphere like the pinnacles of some old Gothic church.

As we went along we saw many guanacos, three of which I shot.

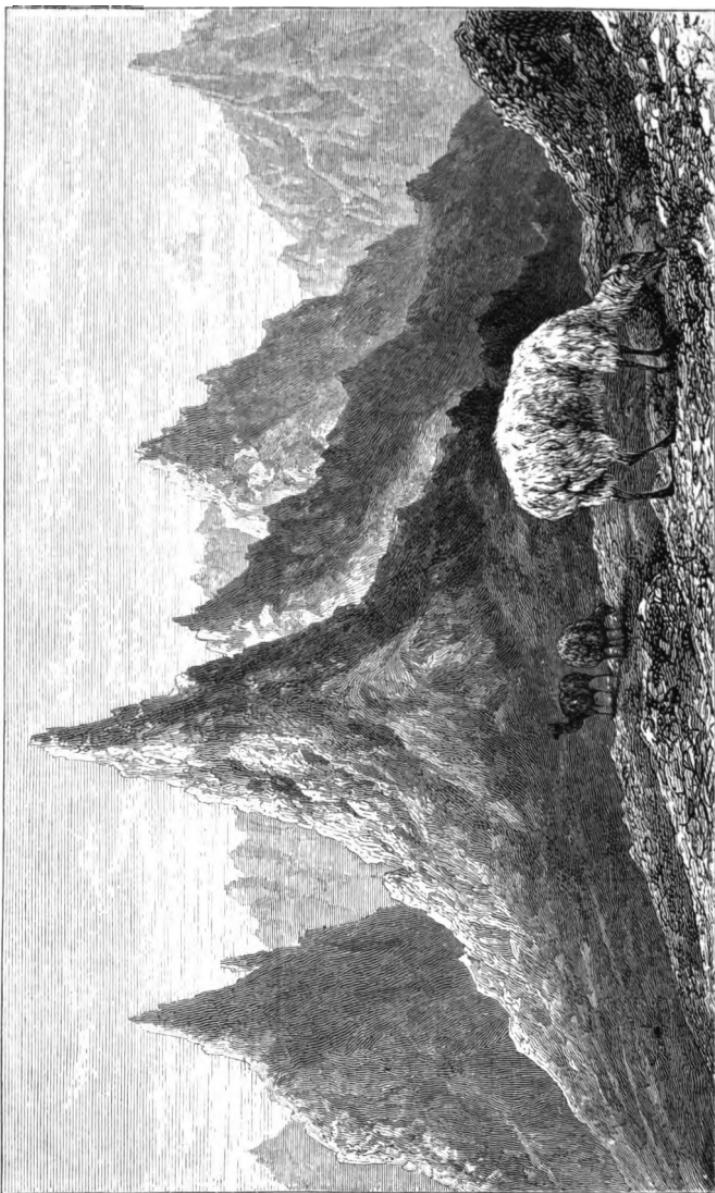
After travelling about eighteen miles we came upon the encampment of our colleagues from the Pacific Coast, who, having surveyed the route upon the Chilian side, had crossed the summit of the Andes by the Planchon pass, and were endeavouring to find a practicable descent for the railway towards the Pampas by the valley of the Rio Salado, up which we had just come; in this, however, they had been disappointed by meeting with a second watershed, 1000 feet higher than the summit of the Planchon pass itself. The only course to be pursued, therefore, was to retrace their steps and try another route by the valley of the "Rio Grande."

CHAPTER XI.

*AMONG THE ANDES—LAS LEÑAS AMARILLAS TO
THE RIO GRANDE.*

MARCH 1ST.—The combined party moved about six miles higher up the mountains, and there encamped in a position where brushwood for fuel could be more easily obtained than at the lower situation. Here we remained to give the mules rest, and to await the arrival of a military escort that was to reach us at this point, and accompany our party during the rest of the surveying operations.

While waiting in the valley of Las Leñas Amarillas (or Yellow Woods), which was the name of our camping-ground, there were many letters both official and private to be written, engineering questions to be discussed, and the news of the day, or rather of months past, to be mutually communicated. Luggage had to be looked over and readjusted to suit the requirements of our new position ; but, notwithstanding all these occupations, those of us who were fond of shooting found time



GUANACOS, NEAR LOS MORROS.

for indulging ourselves in that respect, and had some excellent sport. I was fortunate enough to shoot seven guanacos. Some of my companions were equally successful, but as I have no note of the results of their skill, I can only give with certainty what fell to my own rifle. I believe, however, that more than forty guanacos were killed that day.

I must take this opportunity of explaining that the results here described were not obtained by driving guanacos into gullies bounded and shut in by precipitous sides, rendering escape impossible, and then firing into the helpless herd crowded together like a flock of frightened sheep; as I have heard some men tell of the numbers they had shot in this way, evidently under the impression that they were describing sport of the highest kind. Our results were obtained by careful stalking, the wild and watchful habits of the guanacos (closely resembling those of the chamois) rendering them very difficult to approach. Their colour harmonises so well with the ground on which they feed, that at a distance they are by no means easy to detect; but one peculiarity of theirs gives the sportsman a great advantage. They always appear to have a sentinel posted on the look-out, and he, upon the approach of danger, trumpets a note of warning in a kind of neigh, somewhat resembling that of

a horse ; this sound falling upon the sportsman's ear at once attracts his attention to the flock, which hitherto perhaps he had not noticed, and enables him to arrange his plans how best to approach his quarry unobserved.

We were now well supplied with fresh guanaco meat, and we found that the flesh, especially of the younger ones, was by no means so bad for eating as our first experience had led us to suppose ; besides, it made a fine rich-flavoured soup, which was largely indulged in, and pronounced by all to be of superior quality.

The skins, too, when dried, were very useful, as they served to patch the clothes of many of the party, on which the wear and tear of the rough life we had been leading acted with excessive strain.

The following day some more guanacos were shot by various members of the staff, but I was not out myself, having had important business matters to attend to, which necessitated my remaining at the encampment. Towards evening an escort of twenty soldiers, sent us from Fort San Rafael, came up, bringing with them the missing Scotchman, whose loss, eight days before, had baffled all our searching, and occasioned us much uneasiness. The account he gave of himself was, that, having got a considerable distance behind the party, he was trying to make up his lost ground, when his mule, becoming restive,

threw him and galloped off, carrying away his rifle, which was strapped to the saddle. Left thus dismounted and without food, and despairing of being able to overtake us, he had determined to try to reach Fort San Rafael, which he succeeded in doing after great exertion and hardship, and was very kindly received and treated by the commander of the garrison.

March 3d.—After an excessively cold night we were up early, and, having struck tents and loaded up the mules, started on the march to the junction of the Rio Grande and the Tordillo. At first we had a good deal of climbing by a rugged path, but gradually reached the watershed at a level of 9200 feet above the sea, meeting, as we went along, numbers of guanacos on the mountain-sides. The fall, after passing the summit, was very gradual, and, when we had gone about nine miles from our camping-ground of last night, we came to a spot where the surrounding scenery was of surpassing beauty. Below us, apparently at our very feet, lay the appropriately named “Valle Hermoso” (or Lovely Valley), some ten miles long and two or three in width, flanked upon either side by lofty mountains. A bright and sparkling river flows through this valley, in comparative stillness, after the restless torrent of its previous course down the rough mountain gorge, where it had struggled in its impetuous career to escape from the narrow boun-

daries of the rocky bed which hemmed in its early stages from its source among the snow-clad mountain-tops. The Andes, rich in scenery of greatest grandeur, possess no lovelier spot than this secluded vale, where Nature's charms are spread unstintingly on every side.

Descending by a steep path to the valley below, we rode along it towards its lower end, where the advanced party, crossing over the river, encamped upon its bank. The greater portion of our comrades not reaching this point by daylight, remained upon the other side, being afraid to attempt the passage of the river after dark—a fear which was not removed by the mishap of the cook, who, in attempting to cross over, got an involuntary plunge-bath, to the no small amusement of his companions.

At this point some discontent was shown by the soldiers, who did not relish the idea of proceeding down the valley of the Rio Grande, being apprehensive of meeting the Indians there in considerable numbers, in which case, said their spokesman, it would be going to certain death. Whereupon the officer in command, a fine plucky fellow, demanded in indignant terms if that was not the very object for which they were employed and paid. "But we have not been paid," was the naïve and ready rejoinder, causing no little amusement to the bystanders. This failed, however, to alter the decision

of their commander, who settled the matter in curter terms than are usually adopted in the Castilian language, when conveying unpleasant information. Translated into the English idiom, the remark with which he closed the conference was, "Very well, paid or not paid, down you go."

March 4th.—Accompanied by the chief of the Chilian party, I passed through the gorge of the Rio Tordillo to its junction with the Rio Grande, a distance of some nine or ten miles, sending the others round by a more circuitous but safer route.

The Tordillo is a rapid river, subject to considerable floods, but at the time we visited it fordable in many places; and as it was necessary to cross it more than once, owing to the perpendicular cliffs which overhang its banks, we took our saddle-mules with us to assist in fording it. But for having to cross the river, we should have been much better and safer without them, as there was no path, and we had to scramble sometimes on our hands and feet along the steep slopes, forming notches in them for the mules we led to place their feet in; and wonderful indeed was the intelligence of these sagacious animals. The mule would, with outstretched leg, carefully test the newly-made foothold before transferring any portion of its weight to it, repeating the process step by step until the doubtful part was passed.

At one place a huge overhanging rock barred our

progress, and, look in whatever direction we might, there appeared to be no way of avoiding it.

My companion, whose mule was old and very steady, tried it first, while I with excited interest looked on at the operation. He gradually got the mule to the base of the rock, round which there was just room to creep. The patient brute, glancing down into the chasm below, seemed to realise the position in a moment. Leaning inwards with its side against the face of the rock, it worked inch by inch round the projecting point, until the secure ground beyond was safely reached.

Then came my turn to advance, and, leading my mule, which was a young one, cautiously towards the spot, I moved with difficulty round to the upper side for the purpose of taking off the saddle; but, with the proverbial stubbornness of its race or the confidence of inexperienced youth, the moment I had left its head on went the mule, and no threats or blandishments of mine could prevail upon it to stop. Arrived at the difficult point, and following the example of the one before it, or, more probably, the teaching of instinct, it lay up against the face of the rock, and proceeded to pass the obstacle in a much more rapid and vigorous manner than that already described. A projecting point caught the saddle, and the mule, impatient of the hindrance this caused, struggled to get past, and, losing its

balance, was precipitated down the slope. I looked, expecting to see my mule's body roll over into the chasm below, but, with the activity of a goat, it gained its legs after a fall of some twenty feet in height, and climbed cautiously up to where I stood. If ever there was a penitent mule, that was one. Shame for the impatient behaviour, that had caused the catastrophe, was expressed in its eyes as clearly as if it had the power to explain its contrition verbally. It was a reformed mule from that on, and followed me for the remainder of our route with the patient and sagacious trust of a dog.

As we went along, towering mountains of basaltic rock, with one at least of granite, hung over us above, while far beneath the river flowed in broken course, lashed into fury by the rocks that barred the progress of its waters.

We had cause for some excitement and uneasiness in the perpetual, although unintentional, discharge of stones, dislodged and rolled down upon us from the hillsides, by the guanacos in their haste to escape from the intruders upon their unfrequented haunts.

Twice on our journey did we meet with insuperable obstacles in our path, and had to descend to the river and cross it, to look for a way upon the other bank, by which to proceed. The fording of such a torrent, rushing over a bed composed of rounded boulders of all sizes, was no easy operation, and was

not performed by us without a thorough wetting, rendered more disagreeable by the coldness of the snow-water, and the sharp, keen, mountain air at such a height.

After a toilsome and somewhat perilous journey, we arrived at the end of the gorge, where it debouches into an open valley at the junction of the rivers Tordillo and Valenzuela, whose united waters form the Rio Grande (or Great River). This was to be the meeting-place with the rest of the party, but they had not yet arrived, their route being longer though less laborious than the one we took. While waiting for them I stripped, and having wrung the water out of my wet clothes as best I could, placed them to dry upon the bank, occupying myself in the meantime by running about to keep up my warmth and avoid catching cold. The air was so intensely sharp that I could not continue long in the nude state, and was obliged to resume my wet garments, which, after all, were better than none.

Later on in the evening some of our comrades got safely round and joined us, but the others, being slower in their movements, did not make their appearance till next day.

The point we had now reached was that at which we were to take up the surveys, carried on for so far by the West Coast party, and continue them down the eastern slopes of the mountains to the Pampas.

We had been led to believe that no difficulty of any kind was to be anticipated along this part of our route, having received the assurance of the Government at Buenos Ayres that it had been already explored, the engineers' report being most favourable to the valley of the Rio Grande, as a fine and open one, presenting no difficulties whatever to the construction of a railway throughout its entire length, stated to be about eighty-one miles. A cursory examination of the upper part of the valley showed at once that this description, although applicable to the upper eight or nine miles of it, in no way suited what came after. I therefore determined to take nothing for granted, but to examine everything thoroughly for ourselves.

For this purpose two surveying parties were formed, to work independently of each other so as to expedite the progress of the surveys. The upper of these was to fill in the work as far as the head of the Rio Grande, and then to make its way over the mountains back to Chili, while the lower party prosecuted the explorations downwards to the Pampas, and thence to the place where they had been previously discontinued. I accompanied the lower party myself as long as it was considered safe to postpone crossing the mountains, on account of snow, my instructions requiring that I should examine the proposed route on the Chilian side of the Andes too.

During our journeyings in the valley of the Rio Grande we saw numerous flocks of guanacos, and also fell in with some wild cattle, which no doubt had strayed either from the Indians, or from some enterprising and adventurous persons who had driven their flocks to the valleys to fatten them there, before taking them across the Cordillera to the Chilian markets. On different occasions we sent in pursuit of these cattle, and succeeded, after an exciting chase, in capturing some of them, and found their meat excellent.

Some of the soldiers of our escort, being very expert horsemen, were employed to break in the untamed mules, an operation which taxed their courage, energy, and resources, to the utmost extent, while it afforded the spectators great amusement; and many a brave warrior suffered a series of ignominious defeats, before he eventually succeeded in reducing the stubborn animal he had undertaken to subdue, to proper submission.

On the Rio Grande I launched a portable india-rubber boat, and paddled about in it to the surprise and admiration of some of the natives of our party, who watched the operation with interest. I was by this means able to get round and examine the face of some rocky promontories which were otherwise inaccessible.

Our guide for the mountain pass considering that

a fall of snow was imminent, and that it would be most unsafe to put off crossing the summit any later than March 15th, I was obliged to leave the lower party on the previous day. I had seen a considerable portion of the valley of the Rio Grande, and the surveying party left in it continued their exploration much farther down, in all to a distance of 142 miles from its head, and even then there was no sign of a termination of the mountains, and the river entering on the Pampas, which, had the report previously referred to been correct, should have been met with sixty miles short of the point to which our investigations were carried.

The valley of the Rio Grande lies open for the first few miles, but is frequently narrowed very much, and in many places almost closed in by high mountains descending precipitously to the water's edge. At intervals along it some open places are to be met with, but it is by no means an easy valley along which to trace a line of railway; and towards its lower end it becomes almost inaccessible, the river cutting its way through rugged igneous rocks, with perpendicular cliffs on either side, and nothing but scoriæ and the débris from extinct volcanoes covering the ground and obliterating all traces of vegetation. As the course of the river turned too much towards the south, and away from the required direction, it became necessary to find

some place of exit for the railway to leave the valley and tend eastwards. This was not easy to discover; but after much careful examination, a point at a distance of eighty-one miles from the head of the Rio Grande was selected for the purpose, necessitating, however, for its accomplishment, engineering works of some magnitude.*

Here I must leave the lower surveying party; and in doing so I may anticipate events by saying that they carefully performed the duties intrusted to them, completing the surveys down the mountain slopes, to the Pampas, and thence to Fort San Rafael, at which point the Government ordered the suspension of surveying operations, considering it unnecessary to continue them farther, as there were only level pampas intervening between this point and the place at which we had previously left off, when compelled to take refuge from the Indians, at Fort Media Luna.

* For engineering particulars of this survey, see article in Appendix upon Argentine Railways.

CHAPTER XII.

THROUGH THE PLANCHON PASS—IN CHILI—THE PACIFIC OCEAN—THROUGH THE STRAITS OF MAGELLAN—THE ATLANTIC AGAIN—MONTE VIDEO ONCE MORE.

MARCH 15TH.—Having said good-bye to my companions of the lower party, I mounted my mule, and, after a somewhat tiresome ride, towards night-fall reached the encampment of my other colleagues, in whose company I was to pass over the mountains to Chili.

During the night I experienced several distinct shocks of what I took to be earthquakes; and as we were sleeping in a tent, and had no stone walls or heavy roofs to fall upon us, and the chances of the earth opening exactly underneath and swallowing us up being very remote, I rather enjoyed the sensation, particularly as it was the great speciality of the country, which it would be pleasant to be able to talk about after the danger had passed by.

I am not sure that I had not some intention of faithfully recording my experience in earthquakes,

in a scientific paper, which perhaps, in importance, might have ranked with the celebrated communication on meteors to which the vagaries of Mr. Pickwick's dark lantern, on a memorable occasion, gave rise; but, if so, whatever theories I had formed, they were doomed to be sadly interfered with when the first dawn of morning light showed me that the camp bedstead of one of my companions touched mine, and that what I took for earthquakes was caused by the restlessness of his disturbed sleep, aggravated no doubt by the fact that, owing to the smallness of the tent, his head was exposed outside it to the hail and snow which fell during the night.

My dreams of obtaining scientific notoriety were gone, as was also my chance of further sleep. I therefore revenged myself for the loss of both on my slumbering companions; and, having stirred them up into a wakeful condition, we prepared for a start up the mountains under not very cheerful circumstances.

The peaks of the Andes were all clad with snow, and the weather was cold and threatening. Having got everything ready and the pack-mules loaded up, we started for the summit by way of the head of the Rio Grande, and for a couple of miles along the Rio Valenzuela, which we forded, and thence by the valley of Las Cuevas, hoping, by crossing a pass some 12,000 feet high, to shorten our route

into Chili considerably ; but, before we reached within 1000 feet of the top, one of my companions became so ill from difficulty of breathing that he could go no higher. We were a good deal frightened, as he was unable to make any exertion and could scarcely speak. To attempt to carry him over the summit would be, we feared, to risk his life. We were therefore obliged to desist from the attempt to cross by that pass, and to go to a lower one, retracing our steps by the way we had come.

Darkness fell upon us before we had got down lower than about 9000 feet above the sea, and here we were obliged to encamp for the night, it being unsafe to attempt to continue the descent farther after dark. Our invalid, although somewhat relieved, still suffered a good deal through the night, but next day as we went down he steadily recovered, and became restored to his usual state of health by the time we had reached the valley of the Rio Grande, to the head of which we came back, and then turned to attempt the ascent towards the lower summit of the Planchon, by the more gradual rise of the valleys of the Valenzuela, Azufre, and Ciegos, which succeed each other in the order in which they are here given.

Upon following the first of these rivers, we found its bed rose rapidly, becoming exceedingly rough and tortuous. In some places the guanaco tracks

formed the path along which we had to ride, leading by such dangerous routes over the loose shingle slopes of the mountain-side, with the foaming torrent dashing in the depths below, that the steadiness of our heads was tried in no small degree, notwithstanding the previous training we had gone through in mountain travelling.

Just before emerging from this rugged valley we passed a granite mountain, the stone from which was of a grey colour and of a fine close-grained texture.

On arriving at the Azufre, the valley was more open and its ascent easier. The surface of the ground was covered with volcanic scoriae and pumice-stone. The hill-sides assumed more regularity of surface, with slopes of about two horizontal to one vertical, but were totally devoid of vegetation. As we marched upwards, the ground became more level and open, and the river less rapid and smaller with every step we went.

When the Ciegos was reached, it was evident that we were approaching the summit. The river dwindled into a stream, the stream into a brook, which in its turn shrank into a rill of running water, and this, too, was soon lost in a small patch of marshy land, in which lay the source and fountain of the great river. A couple of hundred yards farther on, after passing some soft and treacherous

spots, we came again upon trickling water; but this time it was running westwards, instead of towards the east, as heretofore, and we knew that we had passed the watershed of the Atlantic and Pacific Oceans, in that unimportant little piece of green sward just behind us. The ground where we stood was exactly 8225 feet above the sea-level (as shown by our surveys), a comparatively low pass for such a chain of mountains as the Andes, in that latitude, although farther south the summit gets still lower.

To the left (turning westward), and at no great distance from us, lay the famous volcano Peteroa, but so much obscured by the intervening peaks, that its position could only be made out by the column of smoke or clouds (we could not tell which) that hung around its crater. On all sides its colossal brethren looked down upon us in gloomy state, from their position as guardians of the frontier line between Chili and La Plata.

Taking one last view behind us, to the east, we prepared for our descent, and following the running water, soon found ourselves scrambling down the mountain-sides, which are here much steeper than on their eastern slopes; and after having reached Las Toscas, three miles and more below the summit, we encamped there near some silver-mines.

Our invalid companion got over the pass without

any renewal of the attack which thwarted the attempt we had made upon the day before, to cross by the higher and more direct route, and we were consequently in good spirits, which were increased by the fact that the weather had a very threatening aspect, and we reflected how fortunate we were to have escaped the danger of a snowstorm at that season of the year, in the valleys on the eastern side, which could scarcely have had for us other than a fatal termination, as, with the path blocked behind us and in front, to advance or to retire would have been alike impossible. In such a case the certain fate awaiting us was death, upon a bed of snow.

During the night the storm which had been threatening broke forth with fury, roaring among the mountain-tops, and whistling and moaning through the tent-ropes, causing our canvas covering to flap about in a manner suggestive of the possibility of its being swept away. Sleep under such circumstances was of course impossible, so we dressed ourselves and prepared for the worst. While awaiting the process of summary eviction, it afforded us some consolation to think that with the morning's light we would most probably be able to move downwards, and that each step in that direction would take us farther from the inhospitable region where winter was evidently setting in with rigour.

Towards daybreak the storm abated, and as soon as there was sufficient light we had our pack-mules loaded up and sent them on, with instructions to the drivers to push down the slopes as far as they could that day. Before following them ourselves, we visited the silver-mines close to our encampment, and examined all their workings, which were on an extensive scale. They are approached by means of adits or tunnels in the hill-sides, which admit of their being easily drained and ventilated. The workings, however, are not all on the same level, as the lode or vein of silver has to be followed wherever it has been displaced by faults and dislocations in the rock containing it. The ore is exceedingly rich, and large quantities of it are extracted and sent down the mountain-sides, on mule-back, to the nearest station, and from thence, per railway, to the smelting-works, where it is converted into bars before being exported to the countries where there is always a steady demand for the precious metals, for purposes of coinage and works of ornamental art.

Having finished our visit of inspection, we started on our downward journey, passing on the way some copper-mines, not far distant from the silver ones we had just left.

Shortly after entering the valley of the "Teno," trees began to appear, and increased in numbers as

we got lower. Many of them were covered with a profusion of crimson flowers, belonging, I thought, to a parasitical plant; but I am told they may have been the natural produce of the ceibo tree; if so, the trees looked anything but healthy in every respect except as to their flowers.

The torrent, along the course of which we made our way, runs in a valley where Nature would seem to have selected various spots whereon to lavish her most beautiful effects. Water falling over precipices, so high that it made one giddy to look at them, descended in a sheet of spray into meadows green as emerald and studded with well-grown trees of beautiful shape and varied tints of foliage, where the collected moisture, once again in Protean form, flowed as a crystal stream or lingered sluggishly in pools with glassy surface, as if to regain its energy and strength before plunging once more in headlong leap into the river in the valley beneath; while on the higher mountain-slopes patches of deep red and purple (due to the mineral ingredients of the soil) enhanced the richness of the colouring, forming gems of beauty in the landscape.

But pleasant as it was to look on scenery like this, the softening haze on the distant plains below suggested how far off them we still were, and how necessary it was to lose no time upon the way. Accordingly we proceeded, till we reached a place

called "Cypressus," so named from the cypress-trees in its vicinity, where we encamped, after a march of about twelve miles that day.

It was the highest human habitation we had met with in the Andes, not taking into consideration the mining colonies at "Las Toscas." We were here informed that this was the greatest elevation at which domestic fowls would live and thrive, but I am unable of my own observation to say whether or not this information is correct.

March 19th.—A fine hot day ensued after a night of hard frost, and, travelling downwards, our route lay all the time through the lovely valley of the "Teno." In its rushing waters we saw in several places birds with the most wonderful power of swimming I had ever observed in any class of divers. From time to time they darted from the rocks into the boiling current, and issued from it on the opposite side of the stream with as much apparent ease as if their course had been through a pool of stagnant water. The facility with which, upon emerging from the river, they scrambled up the smooth-worn surface of the rounded stones was also marvellous. The natives told us they accomplished this by the aid of hooks with which their wings are provided, somewhat similar, I suppose, to the spurs on the wings of the horned plover and the crested screamer.

I was unable, however, to obtain a specimen of these birds to verify the statement, as those that were shot were swept away, and lost to us in the foaming torrent. They certainly use their wings greatly to assist them in climbing, but this would prove nothing, as all birds of the duck family do so.

Towards nightfall we halted in a sheltered spot beside the river, after having come nineteen miles during the day.

Next morning we were early up, and started for Curico, a station on the Southern Railway of Chili, some twenty-two miles off, and a hundred and sixteen miles to the south of Santiago, the capital of the country.

As we approached the central valley of Chili, which lies between the Andes and another chain of mountains of lesser elevation running parallel with them and nearer to the line of coast, we were much impressed with the general appearance of prosperity opening out before us with every step. Irrigation-works of considerable magnitude show the extent to which agriculture has advanced, and other signs of civilisation surrounding the home-steads of the inhabitants, no less than their habits and customs, all speak of a quiet and prosperous population, deserving of the credit and reputation they enjoy abroad.

After a short stay at Curico, we proceeded by rail as far as Gultro, and thence by carriage to the baths of Cauquenes, a lovely and retired spot twenty miles distant among the mountains, where a comfortable hotel, kept by a German proprietor, attracts many visitors during the summer.

It was no small luxury, after five months of camping-out upon the Pampas and among the Andes, undergoing countless hardships and privations, to find ourselves once more in a well-appointed hotel, surrounded by the comforts and conveniences of civilised life, and with an obliging host ready to minister to all our wants.

Never, I will venture to say, did visitors to Cauquenes take a greater number of baths within the short space of thirty-six hours—which was all that was at our disposal to spend there—or more reluctantly leave this temporary resting-place than we did.

March 25th.—Arrived in the evening at Santiago de Chili, a city of 120,000 to 130,000 inhabitants, standing at the foot of the Andes at a height of 1800 feet above the sea, in a position which, for grandeur and the magnificence of its surroundings, can scarcely be surpassed.

A rapid river flowing from the mountains yields a never-failing supply of water, some of it being diverted by artificial channels, through which it

runs in cooling streams along the side of the well-shaded promenade, called the "Alameda," while below the city lies an extensive valley of great fertility, the whole forming a most effective panorama, well seen from the hill called "Santa Lucia."

The houses in the central part of the city are for the most part substantial and well built. There is a pleasant plaza or square surrounded by the cathedral, a large hotel, and some public offices. In its centre are well-cared-for gardens, bright with flowers and ornamented with fountains, where the spray of jets of water cools the air, enticing the inhabitants from their heated houses to lounge through the gardens, and listen to the music of a band which plays there in the evenings.

Here may be seen the *elite* of Santiago; but by far the best time and place to see the Chilian beauties to advantage is while shopping in the Arcade, where numerous windows display their tempting wares in the most effective manner; for the ladies of Chili, like their sisters all the world over, are fond of shopping.

In Santiago traces of earthquakes are everywhere to be met with, and one would think that, under such circumstances, the public mind would become familiarised to such phenomena; but it appears to be universally admitted that earthquakes are among

the few things that custom will not easily reconcile one to.

Perhaps the spot of deepest, saddest interest, in all Santiago is the site of the church where, in December 1863, two thousand persons, of whom the vast majority were women, were either burnt alive, or crushed to death in their endeavours to escape. The story is terribly tragic, and yet so simple. The outbreak of fire, the rush for the doors, which, opening inwards, were of necessity immediately forced into the closed position, condemning the doomed worshippers to an awful death. It has so frequently been told in all its harrowing details by travellers who visited the scene, that I refrain from further reference to any of the hideous particulars, which render the catastrophe if possible more appalling.

After a fortnight's sojourn in Santiago, we went on to Valparaiso, the principal seaport of Chili, situated a hundred and fourteen miles from the capital, with which it is connected by railway. The city is built along the edge of the sea, upon a narrow strip of land at the base of an abrupt hill overlooking it, and on which many private residences are built.

There is little to interest a traveller in Valparaiso, but the view from the roadstead of the snowclad summit of the mighty Aconcagua in the distance, is very fine.

On April 14th we left Valparaiso in the mail-

steamer *John Elder*, commanded by Captain Conlan, than whom it would be difficult to find a better sailor or more agreeable companion, for the purpose of returning to the east coast through the Straits of Magellan, and on the following day we reached the coaling station of Coronel, where a colliery is worked, the fuel from which appears to be but moderately good.

Proceeding thence, there was nothing worthy of note connected with this part of the voyage, except that the Pacific, which had hitherto behaved in a manner worthy of its name, became more rolling as we sailed southwards, and we experienced some rough weather, and met with a good many albatrosses.

Upon approaching the Straits of Magellan, we sighted the four islands known as "Los Evangelistas" (The Evangelists). They are bare rocks, rising but little above the surface of the sea, and must be exceedingly dangerous to mariners in this region during foggy weather.

In the afternoon of the fifth day out from Valparaiso we made the entrance of the Straits, and, the weather being very thick, the captain decided not to proceed, but to cast anchor where we were,—a determination which caused a good deal of grumbling and complaint at the time on the part of some unreasonable passengers.

Next morning, however, when the fog cleared off,



IN THE STRAITS OF MAGELLAN.

we had ample evidence of the wisdom of the course pursued by the captain, as the narrowness of the channel we were in and its dangerous rocky shore on both sides, taken in connection with the strong prevailing currents, made the navigation most difficult.

The mountain scenery was very fine. The glaciers, which almost overhung the sea in some places, shone brightly with a green lustre in the sunlight.

Near Cape Froward, the most southerly point of the mainland of the South American continent, a canoe with Indians from the opposite inhospitable shore of Tierra del Fuego put out to meet us. They were a wretched, half-starved, miserable-looking lot, and seized with avidity the bags of biscuits and salt beef which our good captain threw over to them. Although the weather was very cold, they had but scanty clothing to protect them from the biting frost.

On the night of 20th April we reached Sandy Point, a small Chilian town in the Straits of Magellan, our progress having been impeded by fogs. Upon casting anchor, several boats came off to the steamer with wares for sale, consisting chiefly of guanaco-skin rugs and ostrich feathers; but the prices asked for these articles were so exorbitant that the sales effected were few.

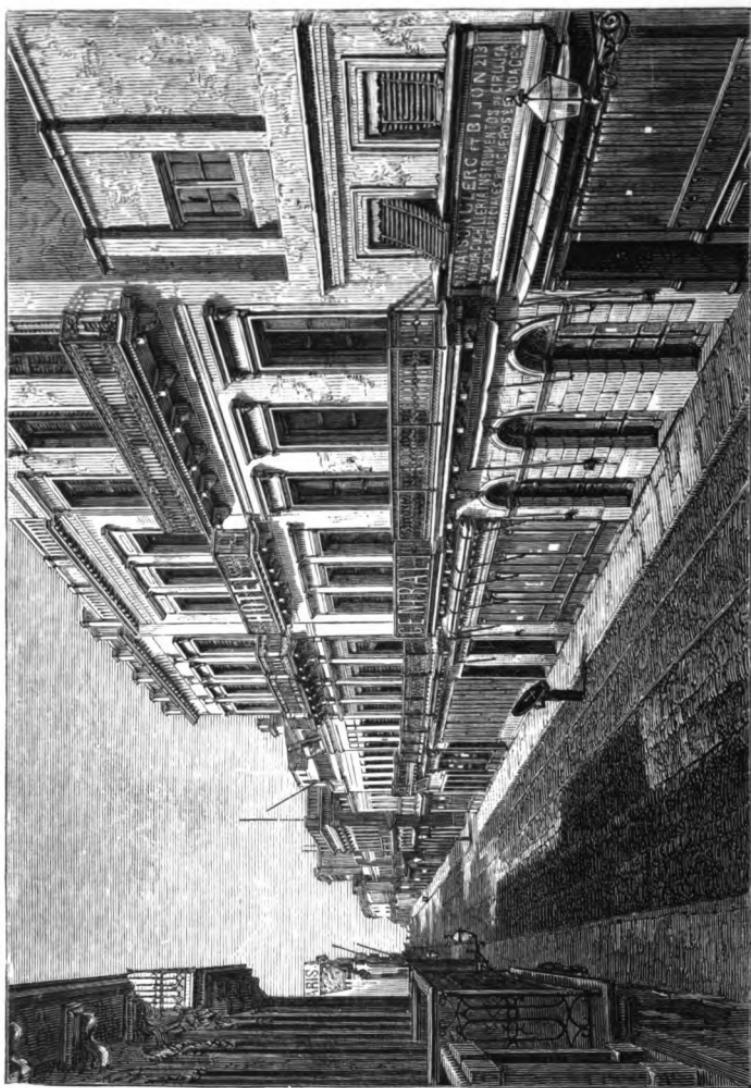
Leaving Sandy Point next morning, we reached

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the eastern entrance to the Straits in the evening, and steamed out into the Atlantic Ocean, favoured with smooth water and fine weather, which lasted but for two days, when we fell in with storms, that accompanied us for the remainder of the voyage to the river Plate. Occasionally the steamer shipped some heavy seas, causing considerable discomfort to the passengers, so that, upon reaching Monte Video on 26th April, we were by no means sorry to get on shore. Our satisfaction was, however, considerably modified upon finding that yellow fever had broken out in Monte Video ; and that, having landed there, we should not be permitted to proceed to our destination at Buenos Ayres, until the epidemic had disappeared.

I will not treat my readers so badly as to ask them to remain with me in a plague-stricken city and witness the distressing scenes enacted there, but will only detain them long enough to give a careful look at the accompanying illustration, from a photograph taken on the spot, and see if they can realise the situation.

I should add that I believe the picture does not refer to the time of our landing in Monte Video, but to the following season, during another visit of the dreaded fever, when I had the misfortune to be again detained an unwilling inhabitant of the City of the Mount.



MONTEVIDEO DURING THE YELLOW FEVER.

Here is a view of the principal street in Monte Video, taken at a time of day (as shown by the shadows cast upon the ground) when traffic usually is at its height, and the way blocked with foot-passengers and horsemen, tramway cars, carriages, and carts, presenting a busy scene of activity and life, now changed by the cold touch of the fell destroyer into a haunt of desolation, where, instead of crowds of passers-by, the only living beings in the foreground are the man who carries on his back a coffin—sole article of trade for which there still exists a brisk demand—and he who has just stepped into the deep shade that overhangs the footpath—fit emblem of the deeper gloom within—to read, perhaps, upon the notice posted on the door, the announcement of the death of some dear friend.

Look at the closed shop-windows with the frequent plague-spot marked upon them, where once the vendor used his highest decorative art to fascinate and lure unwary customers. The showy brightness of that scene is gone, and all is dark and dismal now, silent as the grave. Neglected lie the latest vagaries of fashion; no sound of life reaches the ear or breaks the stillness of that dreadful hush but the hammer on the coffin lid, as it closes the short history of many a life, torn from affection's loving grasp by the ruthless hand of Death.

But I must not keep my readers any longer among such scenes of misery and pain, and it is time for me to say farewell, wishing to all of them a happy and prosperous voyage over life's troubled and boisterous sea, whithersoever bound and from whatever port they hail.

APPENDIX.

I.

PEAKS AND PASSES OF THE ANDES.

Peaks.—After the Himalayas the Andes are the highest mountains in the world ; some seventeen of their peaks reach to a height of 20,000 feet and upwards above the sea, the highest of which, Sorata, is, according to Black's Atlas, 24,812 feet, compared with which Mont Blanc, with its altitude of 15,744 feet, is but a pygmy hill.

The general outline of the chain presents an appearance of considerable regularity, which somewhat reduces the effect the stupendous heights of the mountain-tops would otherwise produce. There are, however, some grand exceptions to this rule, such as in the case of "Tupungato," not to admire which should certainly justify one's being placed among the class of persons who have "no bump for mountains,"—an excuse I once heard made by an American lady to account for her total want of interest in the scenery of the Alps.

The beauty of the Andes is best beheld by viewing them, not, as it were, in one whole picture, but as detached and isolated parts of an almost endless panorama.

LIST OF THE PRINCIPAL PEAKS OF THE ANDES, FROM LATITUDE $31^{\circ} 15'$
TO $41^{\circ} 25'$ SOUTH.

Name of Peak.	Description.	Height above the Sea. Feet.	Latitude South.	Longitude West of Greenwich.	Authority as to Height.	Height of Perpetual Snow-Line. Feet.
Aconcagua	Volcano.	23,910 23,000	32° 0'	70° 36'	Black's Atlas. Darwin's "Voyage of the 'Beagle,'" Fitzroy and Beechey, ac- cording to De Mousy.	...
"	"	...	...	...	Pissis. Rossetti and Stieler.	...
"	"	22,620	32° 41'	69° 58'	Black's Atlas.	14,764
"	"	22,422	33° 10'	70° 2'	...	14,436
Juncal	Volcano.	19,495	33° 14'	70° 14'	...	...
Plomo	Volcano.	16,150	33° 30'	69° 52'	Black's Atlas.	14,108
Tupungato	Volcano.	22,016	33° 25'	69° 51'	Rossetti's List.	...
"	"	20,270	33° 42'	69° 53'	...	13,944
San José	Volcano.	20,000	33° 59'	69° 40'	...	13,874
Maipu	"	17,665	34° 5'	69° 40'	...	13,813
San Francisco	"	17,000	34° 11'	69° 40'	...	13,780
Cruz de Piedra	"	17,125	34° 15'	70° 3'	...	...
Paloma	"	1	34° 20'	69° 39'	...	...
San Lorenzo	"	13,195	...	...	...	...

San Pedro Nolasco	10,955	34° 25'	69° 40'	...
Los Cruceros	...	34° 27'	70° 2'	12,304
Peña Soien.	10,640	34° 30'	70° 10'	...
Tinguiririca	14,690	34° 49'	70° 23'	12,140
St. Helena	...	35° 9'	70° 31'	...
Peteroa	...	35° 12'	70° 35'	10,827
Colorado.	11,860	35° 17'	70° 37'	...
Cerro Nevado	12,970	35° 20'	69° 2'	...
Descabezado Chico	16,160	35° 29'	70° 37'	8,203
Descabezado	10,610	35° 33'	70° 49'	...
Campanario	12,755	35° 37'	70° 28'	7,382
Yeguas	12,320	35° 57'	70° 55'	...
Cerro Payen	11,340	35° 59'	68° 02'	...
Chorreo	8,200	36° 15'	71° 14'	6,496
Chillan	...	36° 47'	71° 32'	6,398
Polcura	9,445	36° 48'	71° 25'	...
Antuao	9,125	36° 55'	71° 26'	5,249
Callequi	8,970	37° 22'	71° 38'	...
Longramai	9,682	37° 50'	71° 43'	...
Yaimas	9,682	38° 20'	71° 47'	...
Villarica	...	38° 50'	71° 58'	...
Llagnel	15,990	39° 27'	71° 38'	...
Rinhu Quethopillan	...	39° 34'	71° 30'	...
Osorno	7,550	39° 50'	72° 30'	4,235
Tronador	9,840	41° 08'	71° 40'	...

Along the Argentine or eastern side there are numerous extinct volcanoes, those in activity being confined either to the summit of the ridge or to the Chilian side. The principal among them, according to De Moussy, are San José, Maipu, Peteroa, Chillan, Antuco, Callaqui, and Osorno, with others farther south more or less active. In this statement of active volcanoes De Moussy makes no mention of Aconcagua, nor does he treat either it or Tupungato, in the list he gives of the peaks of the Andes, as being volcanoes, either active or extinct, but simply as ordinary mountains, and in this respect Rossetti's list is similar; but, after all, this may only be adopting the usual local style of speaking of them. We have the unimpeachable authority of Darwin for asserting that Aconcagua is a volcano, as he speaks of its activity in a description he gives of the eruption of another volcano in Chili, which he witnessed while voyaging in the *Beagle* in the year 1835, making the following observations upon the occurrence:—

“On the night of the 19th (January) the volcano Osorno was in action. At midnight the sentry observed something like a large star, which gradually increased in size till about three o'clock, when it presented a very magnificent spectacle. By the aid of a glass, dark objects, in constant succession, were seen, in the midst of a great glare of red light, to be thrown up and to fall down. The light was sufficient to cast on the water a long bright reflection.

“Large masses of molten matter seem very commonly to be cast out of the craters in this part of the Cordillera.

“I was assured that when the Corcovado is in eruption great masses are projected upwards, and are seen to burst in the air, assuming fantastical forms, such as trees: their

size must be immense, for they can be distinguished from the high land behind San Carlos, which is no less than ninety-three miles from the Corcovado. In the morning the volcano became tranquil.

"I was surprised at hearing afterwards that Aconcagua in Chili, 480 miles northwards, was in action on this same night, and still more surprised to hear that the great eruption of Coseguina (2700 miles north of Aconcagua), accompanied by an earthquake felt over 1000 miles, also occurred within six hours of this same time.

"This coincidence is the more remarkable as Coseguina had been dormant for twenty-six years, and Aconcagua most rarely shows any signs of action. It is open to conjecture whether this coincidence was accidental, or shows some subterranean connection."

I am not aware whether Aconcagua has shown any signs of igneous life during more recent years, but, even if it has not, it must at all events be described as a volcano—dormant if you will.

Now as to Tupungato. I can again bring the weight of Darwin's great name to bear upon the question, for he calls Tupungato a volcano.

I have myself closely examined many extinct volcanoes, and made careful sketches of them—mountains about which there could be no doubt, as the hollow crater and the rugged streams of lava down the slopes told the history of their origin with sufficient clearness. I have also made a number of sketches of Tupungato, and when I compare these sketches side by side, I find it impossible to resist the conviction that Tupungato also is a volcano.

The peaks of the Andes lie for the most part, although not in every instance, along the central ridge, or what may be called the backbone of the system, that is, the

dividing line between the territory of the Argentine Republic and that of Chili. Notable exceptions to this rule occur in the cases of the Cerro Nevado and the Cerro Payen ; the former, which rises from the Pampas to the majestic height of 16,160 feet, flanked by companions of less imposing altitude, is an offshoot from the main chain ; while the Cerro Payen, whose height is 8200 feet, terminates a spur near the foot of the eastern slopes. About latitude 32° S. Aconcagua, the second highest mountain of the Andes (Sorata being the loftiest), raises its summit to a height of nearly 24,000 feet above the sea, covered for some 9000 feet of the upper part of it with perpetual snow, the line of which at this place is set down by geographers at 14,764 feet.

I am aware that it has been argued by a traveller, at a meeting of the Geographical Society, that Aconcagua cannot be anything like the height usually given to it, on the ground that he had seen its top quite bare of snow ; but in this I think he must have been mistaken, as the general evidence of travellers is against him.

There is, however, much diversity of opinion on the part of scientific men as to its exact height. De Moussy says Fitzroy and Beechey made it 22,920 feet. Darwin, however, in his "Naturalist's Voyage Round the World" refers to it thus : "The volcano of Aconcagua is particularly magnificent. This huge and irregularly conical mass has an elevation greater than that of Chimborazo ; for from measurements made by the officers in the *Beagle* its height is not less than 23,000 feet."

Pissis made it 22,620 ; while Professor Rossetti of the Buenos Ayres University, in the list which he compiled of the heights of the Andes, gives it as 22,422, as does also the last edition of "Stieler's Hand Atlas" published by Justus Perthes of Gotha, while Black's Atlas (edition of

1882) places the height of Aconcagua at 23,910. This will suffice, without going on to quote other authorities, to show what want of agreement there exists upon the subject.

The Andes gradually get lower towards the south, till, by the time Patagonia is reached, they have lost much of the grandeur of their appearance.

The line of perpetual snow, beginning at latitude 32° S., is about 14,764 feet, falling to 4235 feet near latitude 41° S.

A mountain called Tronador (or Thunderer), in latitude 41° 18' S., whose height is 9840 feet, owes its name, according to De Moussy, to the noise made by the frequent falling of avalanches from its sides.

Passes over the Andes.—There are said to be in all twenty-seven places where the Andes can be crossed between the Argentine Confederation and Chili, of which eighteen occur between latitude 31° 15' and 41° 20' S., and are those to which the following remarks apply.

The approach from the east side is generally by means of a much more gradual ascent than that in an opposite direction, the prevailing characteristic of the Andes being much steeper slopes upon the Chilian than on the Argentine side; but it by no means follows from this that the flatter portion of the route is the easiest part of it, as in some cases the ground, where very steep climbing becomes necessary, may at the same time present little or no danger to the traveller, while, on the other hand, it may test all his nerve and steadiness of head to cross some level benching on a mountain-side where a yawning abyss opens below him, into which he would inevitably be precipitated by one false step or stumble of his trusty mule.

APPENDIX.

The following tabular statement gives a list of these passes, with their approximate heights and positions, as far as they are known.

LIST OF THE PASSES OVER THE ANDES OCCURRING BETWEEN
LATITUDE 32° AND 42° SOUTH.

Name of Pass.	Height in Feet above See-Line.	Latitude South.	Longitude West of Greenwich.
Los Patos Pass	11,933	$32^{\circ} 30'$	$70^{\circ} 10'$
Uspallata (or Cumbre) Pass . .	12,795	$32^{\circ} 59'$	$70^{\circ} 5'$
Horcones Pass . . . . .	...	...	...
Potrero Alto (or Dehesa) Pass .	13,334	$33^{\circ} 20'$	$60^{\circ} 53'$
Portillo (or Piuquenes) Pass .	13,780	$33^{\circ} 31'$	$69^{\circ} 54'$
Cruz de Piedra Pass	11,293	$34^{\circ} 2'$	$69^{\circ} 57'$
Yeso Pass	8,202	$34^{\circ} 25'$	$69^{\circ} 59'$
Tinguiririca Pass	10,500	$34^{\circ} 45'$	$70^{\circ} 21'$
Las Damas Pass	9,843	$34^{\circ} 59'$	$70^{\circ} 26'$
Old Planchon Pass	10,118	$35^{\circ} 2'$	$70^{\circ} 38'$
New Planchon Pass	8,225	$35^{\circ} 2'$	$70^{\circ} 36'$
Indio (or Tres Cruces) Pass . .	8,458	$35^{\circ} 28'$	$70^{\circ} 42'$
Invernada (or Campanario) Pass	...	$35^{\circ} 40'$	$70^{\circ} 30'$
Maule (or Las Yeguas) Pass .	7,200	$36^{\circ} 8'$	$70^{\circ} 29'$
Chillan Pass . . . . .	...	$36^{\circ} 48'$	$71^{\circ} 16'$
Antuco Pass	7,228	$37^{\circ} 30'$	$71^{\circ} 32'$
Villarica Pass . . . . .	...	$39^{\circ} 0'$	$71^{\circ} 40'$
Nahuel-huapi Pass	2,756	$41^{\circ} 20'$	$71^{\circ} 45'$

The Pass of Los Patos (or that of the ducks), which takes its name, as does also a ridge of mountains in the neighbourhood, from a lake and river upon the route much frequented by wild-ducks, occurs upon the path leading from San Juan to Valparaiso, a distance of 320

miles. On leaving the former place, the general direction of the road for the first eighty miles is a little to the south of west, crossing the Sierras of Tontal at an altitude of upwards of 9500 feet, and then, descending into the valley of the Rio de los Patos, a tributary of the river San Juan, which it crosses, it turns nearly due south, and follows the course of the river upwards towards its source until it nearly reaches the base of Aconcagua, when it sweeps round to the west again, and, mounting rapidly, crosses the summit at the height of 11,933 feet in latitude $32^{\circ} 30' S.$ and longitude $70^{\circ} 10' W.$ of the meridian of Greenwich; dropping down by a very steep descent to Cuzco in Chili (the distance across the ridge between the heads of the two valleys on its opposite sides is about twenty miles), and thence by the side of a mountain torrent to San Felipe, distant not quite fifty miles from Santiago and about seventy from Valparaiso. The total journey from San Juan occupies about ten to twelve days for pack-mules, and from eight to nine days for passengers riding. The principal drawback to this pass is the crossing of the Rio de los Patos, which, when swollen, is difficult to ford; the inhabitants of San Juan therefore find it generally more convenient, when desiring to cross over into Chili, to do so by the Uspallata Pass, as the total distance to Valparaiso by this latter way is only some six miles longer than by the pass of Los Patos, which is not much in so great a journey.

The Uspallata Pass is by far the best known and most frequented crossing of the Andes. It occurs upon the principal route of communication between Chili and La Plata, and generally remains open and free from snow from

November till April. In some places it is very bare of pasturage.

From Mendoza the mule-path is directed to the north, over a barren tract of country devoid of water, for about twenty-four miles, and then turns westwards into a valley, wide at first, but gradually narrowing into a ravine, in which a stream of water is met with near Villa Vicencio, the small inn that constitutes the regular halting-place for the first night, at a distance of about thirty-five miles from Mendoza. The general bearing of the next day's journey is south-west for the entire length of thirty-five miles from Villa Vicencio to Uspallata, where there is also a house that affords shelter and accommodation for the night. At about one-fourth of this distance the Paramillos range of mountains, 9710 feet high, is crossed ; the path then descends to Uspallata, where it reaches the level of 6365 feet.

The next stage, as far as the Rio de las Vacas, is about the same length as the previous one. The route here follows the valley of the Rio Mendoza, keeping to the left or northern bank of that river, and crossing many small tributary streams, the last of them the Rio de las Vacas, of which Darwin writes :—

“ On the evening of the succeeding day we reached the Rio de las Vacas, which is considered the worst stream in the Cordillera to cross. As all these rivers have a rapid and short course, and are formed by the melting of the snow, the hour of the day makes a considerable difference in their volume. In the evening the stream is muddy and full, but about daybreak it becomes clear and much less impetuous. This we found to be the case with the Rio Vacas, and in the morning we crossed it without difficulty.”

The march of engineering science has since altered

the then existing state of affairs, as many years ago a bridge was built across the Rio de las Vacas, by which the convenience and safety of travellers have been greatly increased.

The next length into which the route is usually divided is from the Rio de las Vacas to the foot of the central ridge twenty-five miles, by the valley of Las Cuevas. About a mile up it, stands a small round hut of refuge for travellers, consisting of a single room raised some feet above the surface of the ground to protect it from the snow. This makes a very suitable halting-place, possessing the three requirements of shelter, pasturage, and water. The Inca's Bridge is situated about one-third up the valley of Las Cuevas. Darwin describes it as consisting "of a crust of stratified shingle cemented together by the deposits of the neighbouring hot springs. It appears as if the stream had scooped out a channel on one side, leaving an overhanging ledge which was met by earth and stones falling down from the opposite cliff. Certainly an oblique junction, as would happen in such a case, was very distinct on one side."

Near to the Inca's Bridge there is another shelter-hut, after passing which the path ascends a mountain spur that leaves but a narrow and vertical gorge for the stream to flow through; on the other side of it the valley widens out again and bears grass of good quality.

On reaching the foot of the Cordillera proper, another empty hut is found, at a height of 10,660 feet.

The laborious work of crossing the summit is allotted to the fifth day, on which thirty-two miles have to be travelled in order to reach the Old Guardhouse on the Chilian side.

The ascent is by a zigzag path up the mountain-face until the dividing line of the watershed or "cumbre,"

as it is called, 12,795 feet high, is attained, after which the descent begins, and is much more rapid than the rise from the Argentine side. It passes to the south of the Laguna del Inca and near the Ojos del Agua, close to which stands a traveller's hut; thence by the Rio Juncal into the valley of the Aconcagua river to the Old Guard-house.

For the last stage of thirty-two miles to the town of Santa Rosa de los Andes the route follows the course of the river Aconcagua, crossing it twice. The journey, therefore, from Mendoza to this place, which is a prosperous little town and the centre of the trade across the Cordillera, occupies, as has been shown, six days, and brings the traveller to a point conveniently near to both Santiago and Valparaiso.

The Horcones Pass is a modification of the Paso de la Cumbre. Instead of leaving the valley of Las Cuevas, as the latter does, the Horcones route follows it up to the source of the stream, and crosses the summit close to the Inca's Lake at a rather higher elevation than that of the Cumbre.

It was originally discovered and used by smugglers to avoid meeting the custom-officers on the main path, and is still sometimes used for cattle in consequence of its affording some pasturage for them, which is not to be had upon the upper part of the more frequented route.

The Potrero Alto or Dehesa Pass.—In this case the path follows the same route as the two previously described to near the Rio de las Vacas, where it branches off to the south up the course of the Rio Tupungato and

crosses the summit at a height of 13,334 feet to the north of the volcano Tupungato, and also north of the Cerro del Plomo, and to the south of the Cerro Juncal; thence down the valley of the Mapocho direct to Santiago.

This is a difficult and dangerous pass to travel, and therefore not much used. It possesses, however, the advantage of affording some little pasturage for mules.

The Portillo or Piuquenes Pass is the highest in this part of the Andes. It is the most frequented one after that by Uspallata, as being the shortest route between Mendoza and Santiago; the approach to it is by the course of the river Tunuyan. It crosses the ridge where it is 13,780 feet high, to the south of Tupungato and to the north of the volcano San José, but at a greater distance from it. It then passes the Laguna Piuquenes and follows the rivers Yeso and Maipu in succession, descending eventually to the village of San José north of Santiago.

Darwin says of this pass: "The descent on the eastern side of the Cordillera is much shorter and steeper than on the Pacific side; in other words, the mountains rise more abruptly from the plains than from the Alpine country of Chili."

In this respect I should think the Portillo Pass must differ from all the others, as the usual character of the Andes is that their western slopes are more abrupt than those on the eastern or Pampas side.

The Cruz de Piedra Pass is 11,293 feet high, and lies to the immediate south of the volcano Maipu. The

ascent from the eastern side is by the Arroyo Faja, and the summit is crossed upon the ridge extending from the southern slopes of Maipu. The path follows downward by the river of that name to the town of San José, where it joins the stream from the Portillo Pass.

The Yeso Pass is very low for this part of the Andes, being only 8202 feet above the sea; it is, however, not well known, and very little used. It is reached by a difficult path up the valley of the Rio Diamante, passing to the south of the Laguna and Cerro Diamante, across the ridge to the north of Los Cruceros, and thence down by the Laguna del Yeso, and the very rugged course of the Rio Cachapoal.

The Tinguiririca Pass is approached by the difficult valley of the Rio Atuel, and lies to the north of the volcano Tinguiririca, known also as El Morro Azufre.

Its highest point is 10,500 feet above the sea, having crossed which, the path descends the western side of the mountains by the Tinguiririca river to near the station of San Fernando on the Southern Railway of Chili.

Las Damas Pass, which is 9843 feet high, owes its name, it is said, to the ease with which even ladies may travel over it.

Its position is to the north of the peak called Santa Helena. The way up to it from the east side is the same as that to the Tinguiririca Pass, as far as the highest fork of the Rio Atuel, from which point it diverges towards the south-west, and, having crossed the

summit, turns due north down the course of the Rio Andarivel, a tributary of the Tinguiririca, which latter river the path follows for the rest of the way. In the year 1805 M. de Souillac, astronomer to the Boundaries Commission, made a most favourable report upon this pass, describing it as of such easy ascent and descent, that ladies might travel it on foot with all the facility in the world, and stating that at no part of it did vegetation completely disappear.

This exceedingly favourable opinion differs from that of Dr. Gillies, who did not think it better than the Planchon Pass; in fact, he found it both difficult and dangerous, and his statement is confirmed by the reports of Messrs. Gay and Mayer, and by M. Domeyko, all of whom explored the pass in question.

On the east side, near the top, is the source of one of the tributaries to the Rio Atuel, and on the west that of the Rio Maule, one of the most important rivers of Chili.

The Old Planchon Pass is situated to the north of the volcano Peteroa (called Planchon by the muleteers). The route to it is up the valley of the Rio Salado to that of Las Lefias Amarillas, which it ascends, and then crossing over the watershed between the Salado and Rio Tordillo at a height of upwards of 9000 feet, descends into the Valle Hermoso, through which the Tordillo runs. The path follows the course of the river for some seven or eight miles to the mouth of one of its tributaries, called the Rio de las Vacas, up which the route turns, and, after a winding course, in which it crosses two more watersheds, reaches the level valley of Los Ciegos, conducting to the Planchon Pass itself, where, at a height of 10,118

feet, the path crosses over the mountains to the north of the volcano Peteroa, and falls down by the rapid valley of the Rio Claro to where it flows into the Teno, and thence by the course of this latter river to the town of Curico.

In the year 1866, obstructions were put by the Chilians in the way of travellers by this route, which has consequently fallen into disuse, its place being taken by the newer pass close to it, which has inherited its name and traffic.

The New Planchon Pass is approached from the east side by exactly the same route as that just described for the old pass of the same name, but, instead of crossing the ridge so close to Peteroa and descending by the course of the Rio Claro, the new path, having reached the highest point in the valley of Los Ciegos, which the surveys for the Transandine Railway show to be 8225 feet, at once falls down by the course of the Vergara stream in a very rapid descent to the Teno valley, which it follows for the rest of the way.

The Pass of the Indians, or Tres Cruces Pass, is 8458 feet high, and lies between the Descabezado Chico and the Cerro Colorado. The way to it is either that described for the Planchon, simply altering the course at the Rio de las Vacas so far as passing over into the valley of the Valenzuela, from which the path crosses over into Chili, and descends by the Laguna de Mondaca and Las Tres Cruces ; or it may be reached by coming up the Rio Grande, which is the route usually taken by the Indians. The path is a difficult one, especially upon the Chilian side, and is little used.

The Invernada or Campanario Pass is also approached by the valley of the Rio Grande some distance lower down than that just described. After crossing the boundary line it descends by the Invernada river, passes the Laguna of that name, and farther down follows the Rio Maule. It is little frequented by ordinary travellers, being both difficult and dangerous on the eastern as well as the western slopes; besides, it goes through a country said to be infested with Indians. Its height has not been ascertained.

The Maule or Las Yeguas Pass is also reached from the Rio Grande and one of its tributaries. The summit is crossed at a height of 7200 feet, considerably to the south of the Campanario. The route skirts the northern side of the Laguna Maule, and passes farther down to the south of the volcano Las Yeguas.

The Chillan Pass is but little known, or the way to it, on Argentine territory. So far as the western side is concerned, it is a bad and rugged path along the course of the Rio Nuble.

The Antuco Pass appears, like the Planchon, to give a choice of routes, as there is one to the north and the other to the south of the volcano Antuco. The elevation of this pass is 7228 feet. Professor Rossetti pronounces it to be very high for the latitude, and difficult of access on the Chilian side, an opinion which is probably far nearer the actual facts than the very flourishing report

of this pass by Don Luis de la Cruz, who went over it in the year 1806, and made his way across the Pampas nearly as far as Buenos Ayres, until stopped at Fort Melincué on the Indian frontier in consequence of war, which had broken out.

The Villarica Pass, like that of Chillan, is very little known ; it lies to the south of the Villarica mountain. It is said that the Indians report this pass to be free from snow and open throughout the entire year ; but this, like many other similar reports, must be taken with considerable reservation.

The Nahuel-huapi Pass takes its name from a great lake lying to the north of it and near the summit of the Andes, but on the eastern slopes. To the south stands Mount Tronador. In the year 1855 Don Pedro Rosales commissioned M. Geisse to explore this pass, who reported that the heights to be overcome varied from 990 feet to 2625 feet only. The following year Messrs. Fonck and Hers explored this pass, which has been called after Don Pedro Rosales, and made its height to be 2757 feet, reporting also that an excellent road available for traffic during the entire year might easily be established by it. Still more recently it has been made the subject of exploration by Mr. Cox, a short résumé of which is given in the following extract from the *Buenos Ayres Standard* of August 3, 1872 :—

“PROJECTS OF COX, NICOUR, CRAWFORD, AND WHEELWRIGHT.—Local enterprise and foreign gold are working such wonders in the Argentine Republic, that it is no longer

a question whether we ought to make a railway from this country to Chili, but rather what is the best pass of the Andes to select for the purpose. Before the ink is yet dry on Mr. Crawford's report of the Planchon, which he says is quite feasible, Mr. Nicour is travelling post-haste from San Juan to this city with the plans of his newly discovered pass a little below Paso de Los Patos, which he says is 3000 feet lower than the Planchon.*

"Meantime it is well to bear in mind that Mr. Cox came from Chili through the Andes in a boat, by what is known as the Nahuel-huapi Pass: he left Port Montt, December 16, 1862, with eighteen companions, crossed Lake Nahuel-huapi and then descended the Rio Negro towards Patagones, intending to come out on the Atlantic; but his boat capsized in some rapids, and after a year's captivity with the Indians he was forced to return to Chili. His mission was achieved, for the latitude of the rapids where he was wrecked shows it was the same place where Villarino met a similar disaster in the last century, ascending from Choel-e-choel on the Atlantic side.

"Of course, if we can make a railway by Mr. Cox's route it will save all the labour and trouble of ascending mountains ten thousand feet high. There may be still need for much engineering skill in erecting causeways along river-sides, making curves around precipices, providing galleries of rock to protect the line from avalanches and the like, but the one great difficulty of climbing up one of the loftiest ranges in the world is altogether avoided.

"From Port Montt, on the Pacific, to Lake Nahuel-huapi the distance has already been measured, but we can only

* This proved to be altogether wrong, no pass approaching to anything like so low a level having been discovered in that latitude.

make a rough estimate of that from the said lake to the Atlantic. The route is as follows—

		Miles.
Port Montt to Varas on Lake Llanquihue . . .		14
Varas to the end of the lake at Osorno . . .		25
Osorno to Lake All-Saints		15
Lake All-Saints to Rio Peulla		21
Rio Peulla to Pedro Rosales		10
Pedro Rosales to Lake Nahuel-huapi		28
		<hr/> 113

“ From Lake Huapi a line of 500 miles across the Pampas would reach Azul or Bahia-Blanca, either of which points will be connected with our city, probably in two or three years at furthest.

“ Cox’s account fully confirms the writings of Father Falkner and Villarino as to the excellent quality of the country and soil on the Argentine side of Nahuel-huapi and the mountains. For a full report of Cox’s explorations we refer our readers to the file of the *Standard* for 1864. It is only right to observe that Mr. Cox was not the first explorer in these waters. The Franciscan friar Menendez marked out a route in 1792, and discovered the remains of the Jesuit mission of Padres Mascardi and Elguea, who were murdered here by Poyas Indians about 1702. In 1856 two Germans, Professors Fonck and Hers, followed the Menendez route, and found on the banks of Lake Nahuel-huapi some remains of the boat used by the Franciscan half a century previous. They ascertained the lake to be 537 metres, say 1772 feet, over the sea, being double the elevation of Lake All-Saints. Both Fonck and Cox describe in rapturous terms the magnificent view from the Argentine side of the lake, the Rio Negro winding its way through the Pampas till lost to sight, and all the slopes of the Andes covered with

dense forests, out of which the peak of Tronador rises in a cone to the skies."

In the foregoing remarks I have endeavoured to give all that is useful of what is known of the various passes over the Andes between 32° and 42° south latitude.

II.

THE ARGENTINE REPUBLIC,

ITS GEOGRAPHICAL POSITION AND EXTENT—INDIAN FRONTIERS AND INVASIONS—COLONIES AND RAILWAYS.

Geographical Position and Extent.

The Argentine Republic, or La Plata, as it used to be called (a name now assumed by the new capital of the province of Buenos Ayres), is by far the most important of the three states which constitute the River Plate republics, the other two being Uruguay and Paraguay.

It is bounded on the north and part of the west by Bolivia; the north part follows the 22° parallel of south latitude through about $5\frac{1}{2}^{\circ}$ of longitude, till it meets the river Paraguay, which from that point forms the eastern Argentine boundary down to where it joins the river Parana near Corrientes, or to about latitude $27^{\circ} 20'$ S. A portion of the river Parana, which flows due westward just before it reaches this point, forms here the northern boundary of the Argentine Republic and the southern of Paraguay for about 3° of longitude; the river Parana then turns northwards, but still continues to be the boundary between the two Republics until it reaches a small tributary stream coming from the east, at about latitude $25^{\circ} 40'$ S. and longitude 55° W. This stream

forms the northern Argentine boundary for about $1\frac{1}{2}$ ° of longitude, Brazil being the adjoining country ; then a southerly line is taken between the two, to strike the river Uruguay, which from that point becomes the boundary down to its junction with the Parana and consequent formation of the Rio de la Plata, Brazil being the opposite or bounding country down to below latitude 30° S., where the Republic of Uruguay begins.

From the mouth of the Rio de la Plata the Atlantic forms the eastern boundary ; to the south, the theoretic limits are the Straits of Magellan, between latitude 52° and 53° S. ; but, as that embraces the whole of Patagonia, the inhabitants of which by no means consider themselves Argentine citizens, we may, I think, for practical purposes, adopt the Rio Negro (curving about between latitude 39° and 41° S.) as the southern limit. The remainder of the territory is bounded on the west by the central ridge or summit line of the Andes, which separates it from Chili.

The country thus enclosed is divided into fourteen separate provinces, of which Buenos Ayres is much the richest and most influential. The others are Cordoba, Entre Rios, Santa Fé, San Luis, Mendoza, Corrientes, Tucuman, Santiago, Salta, Catamarca, San Juan, Rioja, and Jujuy, to which may be added the Indian territories of the Grand Chaco in the north, and Patagonia in the south ; these are all united in a confederation, and constitute the Argentine Republic.

The total area claimed as belonging to the State amounts to 1,180,000 square miles, and we may get some idea of the vast extent which these figures represent by comparing them with the size of European countries ; that is to say, the Argentine territory is about equal to that of Great Britain and Ireland with France, Germany,

Austria and Hungary, Italy, Spain, Portugal, Switzerland, Belgium, Holland, and Denmark all added together. But half of it we may consider as occupied by Indians, and therefore as only belonging to the Republic in theory. This brings us to the second division of the subject.

Indian Frontiers and Invasions.

The questions concerning the frontiers have always been among the most difficult that the Argentine Government has had to deal with, nor was it till recently that the matter was taken in hand with a firm grasp.

The boundary-line, which was supposed to mark the limit between Indian territory and that of the white settlers on the frontier, had nothing definite to point it out except an occasional little fort, as two or three mud huts huddled together were styled; and, as the Indians found by experience that these offered no real obstacle to their plundering the settlements and carrying off the cattle to be found there, they kept up a very brisk trade in the business, until at last the conditions of the settler's life became intolerable, and the public voice called loudly for some effectual remedy to be applied to the evil; whereupon a campaign was undertaken against the Indians, who were driven out southwards across the Rio Negro by the present President of the Argentine Republic, General Roca, and that river has since been fixed as the Indian frontier, and great endeavours have been made to prevent their crossing it.

Lest some of my readers might suppose that, in the desire to secure my own safety, and that of the members of the Transandine expedition placed under my charge, I had allowed myself to take an exaggerated view of the

dangers to which we were exposed in regard to the possibility of being attacked by Indians, and that I had consequently described the state of the frontiers at that time in a too unfavourable light, I will give a few extracts and some condensed information from the local newspapers published at the time, which will prove that my description of the state of affairs, so far from being exaggerated, is a mere feeble echo of the loud complaints in which the voice of the nation made itself heard :—

From the Buenos Ayres Standard of December 27, 1871.

“ It would be difficult for even the oldest inhabitant to call to mind any period at which the Indians have been so troublesome as at present. From Frayle Muerto to San Luis, from the frontier of Buenos Ayres to the Andes, they have everything their own way. And yet there is no foreign or domestic war going on to distract the attention of Government from the all-important duty of protecting the frontiers. And all this time the revenue of the Republic is threefold what it was ten years ago, sufficient to maintain a large standing army.

“ Last week, if the National Government had been removed, as proposed, to Villa Maria, we should have had to deplore the captivity of President Sarmiento, his Cabinet Ministers, and the whole *personnel* of the Argentine administration. We cannot let the imagination rest for a moment on so dreadful a contingency.

“ Meantime the Indians are carrying fire and sword on all sides, murdering peaceful settlers, carrying off their families, and making war on the Argentine Republic in their accustomed fashion. It is only surprising that they have not stopped the Central Argentine Railway,

along which they are reported in great strength. Every day brings news of fresh exploits by the savages, and it behoves Governor Castro to look well to the frontiers of this province, for it seems the National Government is powerless.

“The *Eco de Cordoba* publishes the following letter from an officer at Fort Gainza, dated December 8:—

“The Ranqueles Indians have kept us busy last month. First of all they laid siege to one of our forts. Then on the night of the 26th, under cover of a storm, a force of 500 Indians passed Fort Irrazabal in direction for Carlotá: the commander of the fort went out in the morning and took note of the track of their horses. At the same time (25th) another Indian force besieged Fort Triunfo on the north frontier of Buenos Ayres, and put to death seven of the garrison. Two days later another band of 150 savages made an inroad by Tunas; our 8th regiment went in pursuit eighteen leagues, but could not overtake them. On the 29th shots were heard on the north frontier of Buenos Ayres, but it seems to have been a quarrel between some colonists and their employers. The same day we marched to Jagüeles de San Pedro and returned on the 1st, sending out scouts fifteen leagues towards Tunas, but without trace of the invaders.

“On account of these invasions Colonel Baigorria concentrated his forces at Forts Segundo and Irrazabal. The friendly Cacique Calfucurá also sent a courier with thirty horses to give the alarm on the north frontier of Buenos Ayres, the man arriving just one day before the Indians made their foray; but the savages passed into the province of Cordoba, which has been of late the favourite scene of their depredations: we only learned their movements two days later. General Arredondo’s telegram from Cordoba reached us *via* Buenos Ayres to the effect

that the Indians visited Frayle Muerto on the 1st and retired with their booty on the 3d inst., which induced Colonel Beñavidez to remain here watching their exit. Accordingly on the morning of the 5th about eight o'clock cannon-shots from Fort Diaz (five leagues west of us) gave the alarm, and the 8th regiment set off at a gallop.

“ About four leagues off we saw dense clouds of dust, and after an hour's hard riding came up on the Indians with their booty *en masse*. Most of our force was mounted on the skeleton horses supplied by Government. We therefore picked out such as were well mounted, in all ninety-seven officers and men, and charged the Indians: the latter to the number of 500 made a fierce onslaught on our lines, obliging our men to dismount and fight on foot, while Colonel Beñavidez and Major Diaz hastened to their support. Just then an approaching cloud of dust announced our reinforcements, whereupon the Indians took to fight in parallel columns, driving their booty between, and extending over a width of three or four leagues: their retreat was covered by 150 lances, who repulsed our charges.

“ At six P.M. we gave up the pursuit, both men and horses being so done up with the heat and dust that we were unable to collect much of the cattle that strayed from the Indians. We rode towards Fort Diaz in quest of water and reached there after midnight. The result of our day's work was—two Indians killed, several wounded, and 1700 head of cattle recovered: the poor animals were dying of thirst, and we have sent men to drive them. The owners seem to be Mujica of Chucul, Guevaras of Rio Cuarto, Gomez, Bernardo of Villa Nueva, and others. Our officers and men are twelve months without pay, and almost all without horses.’

“ The province of San Luis is in the same alarm as

Cordoba. Between Forts Pringles and Torero a foray occurred on December 3, the Indians carrying off a lot of cattle. Another band of freebooters came into Villa Mercedes (province of San Luis) and carried off horses, whereupon all the garrison was called out.

“The *Progreso* of Cordoba has a letter from Mercedes, December 10, giving the most pitiable account of the state of San Luis:—

“In the time of old Colonel Iseas (1863-68), before telegraphs were thought of, this province was well protected with a handful of 300 men. Now for the past three years it has been a succession of inroads, robberies, murders, and devastation. We have, indeed, forts here and there, horses and officers, generals and garrisons; but the Indians and Gaucho vagabonds do just as they like. Last week they invaded Torero, five leagues from Mercedes, and swept off booty in sight of Fort Rossetti; in the afternoon they descended on Fort Fraga and took away the soldiers' horses. Next morning they visited Malle, three leagues from Fort Febrero, and plundered a convoy of carts, the drivers and peons of which are missing, probably captives.

“If the Government want to check these doings they must send some one to supplant — — with orders to look after the frontier instead of meddling with politics.”

“From one end to another of the Republic we hear the same complaints; the soldiers are badly mounted and unpaid; the Indians every day gain strength from vagabond Gauchos, convicts, and deserters. This is an evil that now assumes formidable proportions. All our new forts, telegraph-wires, &c., seem to count for nothing, since the Indian forays are worse at present than when we had the Paraguayan war to attend to.

"In England a Government and War-Office under such circumstances as President Sarmiento's Cabinet stands to-day could not hold office for half an hour. In this free and enlightened Republic a Minister may disregard alike the necessities of the country or the clamour of the press and public opinion.

"It seems natural to suggest that, in view of the dreadful condition of the interior, the Government of Buenos Ayres should recall Mr. Crawford, yesterday reported at Fort Gainza. No matter what disappointment or mortification such a step may cause to our _____ countryman, who is now plunging into the arid deserts of the interior, we consider it unwise and rash to continue the expedition. The Indians have already, perhaps, taken it as an additional motive for hostilities, and the ordinary risk of such an expedition is increased tenfold by the actual circumstances of the country."

In *El Eco de Cordoba* of 4th January 1872 there is a statistical summary of the Indian invasions during the year 1871 in one department of the frontier only, enumerating more than thirty of them, giving at the same time the date, place, and particulars of each. One of these was a very serious affair, where eighty Indians under the celebrated Blanco attacked "Sarmiento," an important fort upon the frontier (in which there was a garrison of 250 men when we passed by it), and plundered it, pursuing their course northwards as far as "Chemeco," devastating the country as they went along, killing in all sixty-five men, wounding seven others, and taking two prisoners, besides carrying off 223 horses and seventy-six mules from Fort Sarmiento, together with thirty-six horses and seven mules from Chemeco.

Nor was this, although the most important in its fatal

results, by any means the largest of these invasions, and some smaller forts suffered severely at their hands.

While this was the state of affairs upon one part of the frontier, its condition elsewhere was no better, so that the newspapers of every shade of politics—both those in favour of, and those against, the Government of the day—vied with each other in calling for an energetic defence of the frontiers.

One of them, printed in Spanish, but the name of which is torn off the paragraph I kept, says, under date of 10th October 1871: “The reader will see that the Indians may almost be said to live within our frontier lines, so frequent are their incursions.”

In the *Republica* newspaper of 15th June 1872 there were the following comments, referring to the repeated invasions:—

“It would appear as if the Minister has made an alliance with the Indians to hand over the defenceless settlements to be sacked and pillaged.

“If the National Government has not an army sufficient to answer for the frontier: if it is unable to prevent and punish the invasions, what is more natural than that it should give to each settlement the arms required for its National Guard, to the end that they might be able to protect themselves in each locality if necessary?”

Another Buenos Ayrean paper (the *Tribuna* of June 16, 1872), a journal very favourable to the Government, in referring to an article in *El Nacional*, suggesting that, as the Indians had been permitted to penetrate so far, they might eventually reach the suburbs of the city of Buenos Ayres itself, says—

“This appears to us *trop fort*; but we think that our colleague is right in saying that the question has become very serious, for, except the frontiers are secure,

civilisation for the country districts is impossible, and our principal source of wealth will disappear."

I might multiply examples of the kind, as the public complaints were numerous enough, but I will only give one further extract, which is very much to the point, as it shows that the next surveying party sent out after the one I had the honour to have charge of, although employed much farther to the north than we were, and close to the line of forts, protected also by an escort of an officer and twenty-eight men,—a larger number than was ever given to us, except our first one,—notwithstanding all these favourable conditions, this surveying party was attacked by a comparatively small body of about fifty Indians, and, although they defended themselves bravely, the Indians succeeded in effecting their purpose of carrying off a number of the horses and cattle belonging to the surveyors; paying dearly, it is true, for the spoil acquired in the dead bodies of twelve of their companions left upon the field. The following is the newspaper account referred to:—

From the Buenos Ayres Standard of May 21, 1874.

"THE TRANSANDINE RAILWAY.—SURVEYING PARTY ATTACKED BY INDIANS.—Mr. Clark's engineers were attacked by Indians on the 9th inst. between Junin and San Luis, the following particulars being supplied in a private letter reproduced in the *Republica* of yesterday.

"Mr. Louis Huergo, chief of the surveying party, was accompanied by Mr. Stephen Dumesnil, the Government engineer, and a staff of assistants. They started on Saturday the morning of the 9th inst. from Fort Verde, towards San Luis to mark out the route, being escorted by Major Aureliano and twenty-seven troopers. At noon

the scouts ahead gave alarm of Indians in sight, whereupon Huergo and Aureliano hastened to collect their men, some of whom with Dumesnil were two miles off, surveying.

“A square was at once formed 120 yards on each side, with the cattle and horses in the centre. The north line was formed by three waggons, defended by Huergo and his assistants, the south and west sides by the twenty-seven troopers, and the east by the Gaucho peons, who had tied knives on long sticks for lances. As the wind was from the north, it was expected the Indians would set fire to the grass on that side, and to prevent the flames reaching the carts, a wide ditch was hastily dug.

“At half-past one the Indians appeared westward, driving the engineers and scouts before them at full speed, the savages being about fifty in number, splendidly mounted, and coming down like a whirlwind in line of battle within 500 yards of the square. The Cacique then rode forward to within 300 yards for a parley, and Major Aureliano advanced to meet him; the former accused the Christians of coming to plunder the Indian hunting-grounds, and offered to allow them to retire unhurt if they left their waggons and cattle to the Indians.

“The Major replied that if the Indians would be content to take a ration of beef for all present he would give it to them, otherwise a fight was inevitable. The Cacique turned quickly round, brandished his lance as a signal, and a trumpet sounded from the Indian ranks, at the same time that a volume of smoke appeared northward, and the savages came down with a thundering charge on the troopers of the west face.

“At a distance of sixty yards they were received with

a volley which sent some of them rolling from their horses ; but, without being at all dismayed, they made a flank movement on the north side, where the engineers were posted behind the waggons, and received them in like manner with a deadly volley.

“ Just then the horses and cattle in the centre, which had not been tied in the haste of preparations, were seized with terror at the approaching flames and the loud reports of musketry, and broke through the southern line of troopers, running frantically over the camp. This was just what the Indians desired, and they accordingly desisted from the attack to go after the cattle.

“ Major Aureliano mounted his men and started in pursuit, while Huergo and his assistants endeavoured to save the waggons from the flames. The Indians in driving off the cattle made a stand three times, and fought so wickedly that the Major and three of his men were badly wounded with lances. It was, therefore, impossible to continue the pursuit, the troopers’ horses being also quite exhausted. The battle had lasted three hours, and twelve Indian corpses were counted on the field, two having been shot by Huergo, and one by Dumesnil. Litters were made of ponchos and arranged in the waggons for the Major and wounded soldiers, the cavalcade proceeding slowly back to Fort Verde, where they arrived half-dead of cold and hunger at 2.30 next morning, the darkness of the night being lit up by the blazing camp for over two leagues, which served to guide them in their course.”

Such was the insufferable condition of affairs when it was determined to select a new and more easily defended line for the southern frontier, along the course of the Rio Negro, over which General Roca drove the Indians in 1879, as previously mentioned.

The boundary-line thus formed stretches across nine degrees of longitude, and would probably be about 630 miles in length from the Atlantic to the summit of the mountain at Nahuel-huapi, measuring along the general direction of the river without following its minor sinuosities.

No doubt if the Indians can be kept south of the Rio Negro the security of the settlers will be established, but it is not to be expected that the former would submit to be driven from the Pampas and banished to Patagonia, quietly abstaining from making repeated attempts to cross the frontier and visit their former hunting-grounds. Without entering into the moral question involved in the proceeding, it might be well, even on the lower grounds of expediency, to pay the Indians something for the territory wrested from them, and to guarantee that no farther encroachment would be made south of the new limits, provided a treaty to that effect could be brought about. The experience of the results of the treatment of the North American Indians in Canada would lead to the hope that such a course as that suggested might not be unsuccessful.

Colonies.

As some disparaging remarks of mine in the body of this volume, with regard to a colony I had visited while on the Transandine expedition, may be taken as generally descriptive of Argentine colonies, I think it better to refer to them somewhat more fully, although it is a very difficult subject to deal with fairly without allowing oneself to be influenced by prejudice upon the one side or the other.

Of the vast expanse of territory of La Plata, only a

fringe can be said as yet to be inhabited, and it is therefore not unnatural that the Government of the country should encourage the establishment of colonies in advanced positions, in the hope that the settlers there would act as pioneers of civilisation and draw others after them. The desire to foster immigration by this means—for the colonists were generally newly arrived in the country—may have led the Government on some occasions to grant concessions for the establishment of colonies too easily, and without sufficient safeguards for the protection of the colonists while still ignorant of the ways of the country. Again, proper care was not always taken to select a fertile soil and suitable position whereon to start each colony; hence they have not always prospered.

It may here be desirable to explain more clearly the distinction between a so-called colonist and an ordinary immigrant or settler. The latter, if he does not find employment in the towns, generally hires himself out to some countryman of his own to look after sheep on some of the large properties, called *Estancias*, where he is supposed to be able to look after a flock of from 1000 to 1500 of these animals, which he does on horseback, preventing their straying too far, and driving them into the "corral," or fold, every night.

The work on a cattle estancia is much more laborious and exciting, dealing with the half-wild animals. The men employed at these establishments are nearly always natives of the country, and require to be excellent horsemen, and very expert in the use of both lasso and bolas. Broken legs and arms are common on cattle estancias, and there is usually some "bone-setter" about the place, whose skill in his calling is frequently very remarkable.

The colonies, on the other hand, consist for the most part of grants of public land from the Government to private

individuals, who undertake on their part to people the districts thus conceded them with a stipulated number of colonists within a given time, and for this purpose they divide up the land into square or rectangular farm lots, generally of about eighty acres each, which they sell to families at a low rate, upon condition of their settling down and building on them, usually giving three years for complete payment of the purchase-money.

Wheat is the principal crop grown in these settlements,—so much so, that in Santa Fé they are sometimes spoken of as “wheat colonies,” and most glowing accounts are to be met with in the public papers of the splendid crops grown and the general prosperity of the colonists. Farther on, in the article upon Argentine Railways, some very important information concerning the colonies will be found.

It cannot be disputed that settlements of this kind have become most numerous, and that their number is rapidly increasing. Some that I visited in the province of Santa Fé were in a very flourishing condition, and they have since, according to common report, gone on steadily improving.

The colonies have become a power in the State, and they certainly deserve, and appear to receive, the thoughtful consideration and support of the Government.

The President of the Republic in his late message to Congress speaks of them as follows:—

“Colonisation has been attended to so far as the votes of money for it admitted, but the sums allowed are inadequate and should be increased. Some colonies have been surveyed, others are in process of being measured, and orders have been given to trace sites for two new ones on the slopes of the Andes, four in Patagonia, and three in Misiones.

"The province of Santa Fé is still the advanced guard in colonisation, and now possesses seventy-eight colonies with 55,143 settlers, who produced last year over a million fanegas (470,000 quarters) of wheat alone.

"Entre Ríos has seventeen colonies with 9905 settlers.

"The other provinces are beginning to think seriously about populating their lands now lying idle. Cordoba has placed at the command of the National Government eight leagues (surveyed) in the department of Rio Cuarto.

"The time, therefore, is drawing near when we shall be able to send precise maps, and offer, in the very centres of emigration, lots of land in any part of the Republic to suit all newcomers in soil and climate."

There is one point that intending colonists should bear in mind, namely, that all colonies are not equally well circumstanced, and they should therefore, if possible, see the place they propose to settle in before making any purchase or binding themselves to it. Where each person cannot do this for himself, they should club together and arrange for one of themselves to go and examine on the spot into the situation, the fertility of the soil, and the supply and character of water to be obtained there. A little careful attention to these matters at starting may save great disappointment afterwards, and, where there are so many eligible places to choose from, it would be a pity blindly to select an undesirable spot whereon to settle.

Railways.

To write the history of railway progress in La Plata would require a volume to itself, but even a short notice of it may not be out of place in this Appendix. The eminent writer on statistics, Mr. M. G. Mulhall, an

excellent authority on all matters connected with the River Plate, has very kindly sent me a tabular statement which he carefully compiled of the total mileage of Argentine railways opened up to the close of the year 1882, giving the particulars of their first cost, quantity of goods and passengers carried, gross and net earnings, which will be found upon next page.

Since this statement was made up, considerable extensions of the railways referred to in it have been made, as during the past twelve or fourteen months the mileage of railways opened or ready to be opened to traffic in the Argentine Confederation has probably been increased by about one-third of the total length which existed in the country at the close of the year 1882, comparatively one of the most gigantic strides ever made in railway progress in any part of the world.

In the case of the Buenos Ayres Great Southern Railway, I can bring the information down to a still later date, which I will now proceed to do.

The gross receipts for the year ending 30th June 1883	
were	£583,969
Or an increase of 22.07 per cent. upon the previous	
twelve months.	
The working expenses were	299,046
Or 51.21 per cent. of the gross receipts.	—
Leaving a balance to profit account of . . .	£284,923

From which the Directors, after paying interest upon debentures, &c., declared a dividend upon the ordinary stock of the company of 8 per cent. for the year, with a bonus of 3 per cent., equivalent to a total dividend of 11 per cent. per annum,—a result which is certainly most encouraging to the stockholders and highly creditable to the management of the concern.

ARGENTINE REPUBLIC (1882).

Name of Lines.	Miles Opened	Total Cost.	Passengers Carried.	Tons of Goods.	Receipts.	Working Expenses.	Net Receipts.	Percentage of Net Receipts on Capital.
Buenos Ayres Great Southern Railway	350	£2,772,000	572,000	240,000	£513,000	£259,000	£254,000	9.2
Buenos Ayres Western Railway	282	2,007,000	1,278,000	436,000	379,000	189,000	190,000	9.5
Central Argentine Railway	246	1,776,000	105,000	194,000	333,000	131,000	202,000	11.3
Andine Railway	217	1,260,000	20,000	75,000	61,000	36,000	25,000	2.0
Tucuman (or Great Northern) Railway	341	1,720,000	55,000	77,000	168,000	97,000	71,000	4.1
East Argentine Railway	99	976,000	19,000	48,000	41,000	31,000	10,000	1.0
Campagna Railway	50	947,000	159,000	80,000	63,000	33,000	30,000	3.1
Buenos Ayres Northern Railway	19	458,000	505,000	67,000	49,000	31,000	18,000	4.0
Ensenada Railway	37	721,000	935,000	100,000	70,000	46,000	24,000	3.3
	1,641	£12,637,000	3,648,000	1,317,000	£1,677,000	£853,000	£824,000	6.5

The position of the line at present is this : It has 476 miles opened to traffic, and another 164 miles so nearly finished that they will in all probability be opened before this volume appears. The whole of the works contemplated by this company will then be completed, with the exception of an extension of about fifty-three miles from Tandil to Juarez, the construction of which is now being undertaken.

The general direction of the Buenos Ayres Great Southern Railway is southwards or a little to the east of south for the first fifty-five miles from the city which gives it its name ; the principal line then trends towards the south-west for a farther 300 miles, passing Azul about midway. Its next direction is towards the south again, and it keeps to that course approximately for some 93 miles farther, till it reaches Bahia-Blanca, about 448 miles distant from Buenos Ayres.

The branch line from Altimirano junction, fifty-five miles south of Buenos Ayres, is directed a little to the east of south, by the towns of Chascomus and Dolores, a distance of seventy-two miles. It then also turns towards the south-west, and continues to Tandil, 120 miles farther on. From this point the extension to Juarez before referred to trends in the same direction, or nearly south-west.

The following paragraph relating to this line is extracted from the *Buenos Ayres Standard* of 7th October 1883 :—

“ The glorious Southern Railway has opened its new section to La Gama, 455 kilometres * from town. The run out by the regular morning train is made in fifteen hours. La Gama is the centre of a very splendid country, and the station is of the category marked first-class. Curu-

* A kilometre is about five-eighths of a mile, or more correctly 0.6214 miles.

malan is 65 kilometres farther out, but the locomotive runs with the contractor's waggons out to Pigué now, we suppose, which is at the foot of the Curumalan mountains, and 580 kilometres from the city. Bahia-Blanca is 711 kilometres, and half the section is already done by our go-ahead friends, Messrs. Barber & Wells, so that in a very short time we can run through from town to Bahia-Blanca."

The editor of this paper, in the same number of it, while describing a visit he had recently made to the far south of the province, writes thus:—

"There is nothing in the River Plate that affords a greater lesson to us all than the Buenos Ayres Great Southern Railway, which, as an enterprise, has proved the most brilliant in this or any other country. A generation has grown to manhood since it was necessary to place a clerk on the top of the Buen-Orden hill, to count the carts, horses, passengers, and bullocks passing in and out during the day, with the view to convince the legislators of Buenos Ayres that there was traffic enough to support a railway to Chascomus. Well do we remember that blind eventful period, when the only man who could read our future was Edward Lumb,* nor shall we stop here to narrate all the difficulties that were put in his way when he had the genius to propose the construction of the Great Southern Railway. Happily for the country, his great ability and influence triumphed over the narrow prejudices that all but defeated the measure; but intimately acquainted as we are with the history of this railway, whose cradle it was our privilege to rock, we can never travel over it without raising our hat to the memory of

* Mr. Lumb was the original concessionaire of the Buenos Ayres Great Southern Railway.

Mr. Lumb. As we stood on the unfinished track at Pigué, 580 kilometres from town, and beneath the shadow of the frowning mountain, we could have wished to lift the lid of the coffin, and wake up the departed founder to witness now the work of his brain, his genius, and his soul.

“Henceforward let no man judge the country, or its progress, or its trade by the custom-house. The railways, their extensions, and their works are the true barometers. The movement of materials and workmen that we witnessed along this extension fairly astonished us; and yet all we saw going on around was but a tithe of what is doing on the Government lines up the country, the Western Railway, the Transandine Railway, the Casado Colony Railway, &c.”

It is no idle boast of the *Buenos Ayres Standard* that it rocked the cradle of the Great Southern Railway in its infancy, for it has always been the fostering nurse of every project that could tend to benefit the country. But, if the *Standard* rocked the cradle of this precious infant, I may, I think, fairly claim to have made its bed and guided its first tottering steps; and, while I agree with the editor as to the fitting tribute he paid to the memory of Mr. Lumb, there are other gentlemen so closely associated with the initiation of this enterprise that they too, in my opinion, deserve great credit for the services they rendered. No doubt Mr. Lumb had a great deal of opposition to contend against, and infinite trouble in regard to the arrangements for his concession; but, when it was obtained, and an English company formed to find the capital and carry out the undertaking, then the real difficulties began.

The present chairman and deputy-chairman of the Board of Directors—Messrs. Parish and Fair—were the

gentlemen who undertook the difficult task of negotiating with the Provincial Government for the modifications in the original concession which were found to be necessary before it could be got into working order ; and to the zeal, patience, and assiduity with which they discharged the delicate and laborious duties devolving upon them during the prolonged negotiations which ensued is due, in a great measure, the fact that the railway was eventually constructed.

There is a third gentleman, too, upon the Board of Directors—Mr. Drabble—who, if he did not actually help to nurse the baby railway, dropped in occasionally and administered some “soothing syrup.”

There were Messrs. Thomas and Alfred Rumball, the company's engineer-in-chief and resident engineer, who toiled unceasingly in their respective positions. Next we come to the contractors, Sir Morton Peto and Mr. Betts (for whom I acted), then at the zenith of their glory, whose works of magnitude in all parts of the habitable globe speak of the immense nature of their undertakings. To me their names will always be associated with a feeling of the deepest respect and esteem.

The gentlemen I have mentioned are those whose energy and skill brought into existence the railway of which we now feel so inclined to boast.

It did not, however, jump into its present prosperous condition all at once, but worked up gradually and steadily from modest, though not unsatisfactory, receipts at the time of its opening in the year 1866 : nor should it be forgotten that the success of the Great Southern Railway was largely due to the very efficient staff of officials who have been intrusted with the affairs of the line. The first general manager, Mr. Banfield, wore himself out and died at his post, and a worthy successor was found

for him in Mr. George Cooper, who, with Mr. Roberts, locomotive superintendent, Mr. Ware, the engineer in charge of the extensions, and Mr. Coghlan, the local consulting engineer, look after their respective departments in the maintenance and working of the line and the construction of new works, and it would be a hard matter to get together a better or more efficient staff.

The basis of the original concession for the Great Southern Railway was a 7 per cent. guarantee upon its capital, but it has long since passed this boundary-line, and by mutual consent and compromise the conditions affecting guaranteed railways have ceased to apply to it. For a portion of the early extensions the Government granted a mileage subvention, but the later ones have been carried out without this assistance.

The success of this railway has been so great, and its influence upon the country so beneficial, that it would not be easy now to distinguish between their interests. The *Buenos Ayres Standard* has well said of it, "To write the history of the Great Southern Railway would be to describe the progress of Buenos Ayres since its initiation."

A further homage has been paid to it in the prospectus of almost every railway project since undertaken in the River Plate, where the results obtained by the working of the Great Southern are quoted to show what may be expected to follow as a matter of course in every other case ; a style of reasoning not strictly logical in its inferences. For this glare of reflected light is not always a safe medium through which to view the prospects of each new enterprise, since, until it can be shown that the conditions of the two cases are similar, no comparison can be fairly instituted between them ; and it is quite conceivable that, of two lines in the same country, one might be as prosperous as the other was the reverse.

The gauge of the line is 5' 6", and the permanent way consists of steel rails laid upon cast iron sleepers (Livesey's patent). The gradients and curves are all of a favourable character, and the earthworks and works of art very inconsiderable.

The Western Railway of Buenos Ayres was originally begun by a joint-stock company, in the year 1857, but, before it had reached an extent of more than a couple of miles, it had to be taken in hand by the Government of the province, to which it now belongs. Its eastern terminus is in the city of Buenos Ayres, whence it forms a sort of radiating system, consisting, so far as it is already opened to public traffic, of the following lines:—

	Miles.
Buenos Ayres to Bragado	133 $\frac{1}{4}$
Branch from Lujan to Pergamino	100
" " Merlo to Lobos	42 $\frac{1}{2}$
" " to Chacarita, at Buenos Ayres	6 $\frac{1}{4}$
 Total	 282

There are, however, important extensions now in process of construction; for example, the length from Bragado to Nueve de Julio (about 30 miles), which, according to recent accounts from the River Plate, was expected to be finished by the end of November 1883; the line from Pergamino to San Nicholas (45 miles), almost ready for opening at the same time; and the section, of some 50 miles, from Lobos to Saladillo, the works on which were being pushed on with vigour.

Strictly speaking there is another extension, now in process of construction, namely, that from Mercedes, in the province of Buenos Ayres, to the Villa Mercedes in San

Luis (a length of about 358 miles), with which the Western Railway system should be credited ; but, as it is included in a concession held by Messrs. Clark of Valparaiso, and is known by a variety of names or titles, the most correct being, I believe, the Buenos Ayres and Pacific Railway, I shall deal with it separately in its proper place.

The board of the Western Railway have recently decided to construct a further section beyond the Nueve de Julio to a place called Pehuajo, for which purpose they have ordered the necessary surveys to be made.

The gauge of the Western Railway and its branches is 5' 6", and the line traverses a very similar country to that occupied by the Great Southern. The earthworks and works of art are very light and unimportant, and the curves and gradients of an easy nature.

The published accounts of the Western Railway show that it has a large and profitable traffic, and is a most valuable property.

The Central Argentine Railway—from Rosario, on the Parana, to Cordoba, which lies inland—has a total length of 246 miles. It was undertaken by an English company, about the same time as the Great Southern Railway was started, with a 7 per cent. Government guarantee upon the capital. Messrs. Brassey, Wythes, & Wheelwright constructed the works, which were begun in 1863 and finished in 1870. The company's engineer-in-chief was Mr. Woods, Vice-President of the Institution of Civil Engineers, and Mr. E. H. Woods was the resident engineer.

The country through which the line runs is exceedingly level, so that the earthworks are very light, and the curves and gradients extremely easy ; the bridges and culverts also are few and unimportant.

The gauge is 5' 6". At first this railway was not a financial success, but latterly it has grown greatly in importance, as shown by the most favourable statement of traffic for the year 1882.

The extensions of the Tucuman Railway cannot fail to act as a considerable feeder to the Central Argentine, and this must also be the case with the Andine Railway so long as the traffic from San Luis, Mendoza, and Chili passes over the Rio Cuarto line, but it would naturally be diverted by opening the railway to connect Mercedes in the province of San Luis with the town of the same name in Buenos Ayres, which is now being constructed. The continuation of the Campana Railway to Rosario, now talked of, would be of great benefit to the Central Argentine Railway, as it would by that means be brought into direct connection with Buenos Ayres.

The fact of having an important and growing town like Rosario, with its port, at one terminus of the railway, and the special facilities for loading and discharging ships there, must be taken into account when investigating the prospects of the Central Argentine Railway.

Mr. Mallet, the English Vice-Consul at Rosario, has gone carefully into this matter in a recent report to his Government upon the condition of Rosario and the Province of Santa Fé generally, printed in Part VII. of the Consular Reports. My extracts, however, are taken from the article upon the subject which appeared in the *Buenos Ayres Standard* of 7th Oct. 1883.

Mr. Mallet describes Rosario as, next to Buenos Ayres, "the most important and commercial city in the Republic."

It has a population of about 40,000, and is rapidly increasing. The report, after referring to a previous one made by the Vice-Consul's predecessor in the year 1878, goes on to say—

“During the period that has elapsed since that review was furnished I have to report an unbroken, rapid, and continuous augmentation, not only in trade and commerce, but also in the productive powers of this rich province of Santa Fé. The cause is easily explained. The port of Rosario is the natural highway or key to and from the vast interior; the trade is, therefore, not wholly a local trade, as it now supplies most of the interior provinces with a very large portion of the imported merchandise which they consume, and which formerly used to be purchased from the Buenos Ayrean market, but is now to a great extent imported direct. The extension of railways into the interior, the continued inpour of immigration, combined with the peace the country has enjoyed, have placed Rosario on a footing of advancement and prosperity such as few cities of South America can boast of.”

Commenting upon the foregoing paragraph, the *Buenos Ayres Standard* says:—“The above are bold words to use in reference to anything appertaining to Argentina, with its record of progress and prosperity which immeasurably eclipses the story of a hundred battles. The figures which Mr. Mallet gives, however, are quite sufficient to warrant no little enthusiasm. The population of the province of Santa Fé in 1876 was 24,042; in 1881 it was 54,869; the number of acres of cultivated land increased from 244,200 to 765,980; while the value of the wheat crop in 1877 was £365,965, and in 1881 £852,465, while for 1882 it is estimated at £1,200,000. The total population of the province is said to be 200,000, but this number is rapidly increasing, and for 1881 the aggregate wealth of the Sante Fé colonies was computed at £5,051,887, showing an increase of 400,000 over 1880; the sum of £400,000 has been spent in nothing else but fencing wire during the past five years.

"As to Rosario alone, it should be borne in mind, says the Vice-Consul, that this is a transit port for the commerce of Bolivia and ten of the large provinces in the interior. The custom-house value of the exports and imports—20 per cent. less than the real value—increased from £4,709,641 in 1880 to £6,923,773 in 1882. No less than four lines of ocean steamers trade direct to the port, two of which are English, calling twice each month, but an increased service appears imminent. The total trade in British vessels from Great Britain and British colonies with cargoes increased from 42 vessels and 33,303 tons in 1881 to 87 vessels and 65,947 tons in 1882. During the year 103 British ships, with a tonnage of 73,171, entered the port of Rosario—nearly as many vessels as those of all other nations put together. It will be of interest to shipowners to know that 75 per cent. of the British vessels that have cleared from Rosario during the year loaded here for Brazil, Europe, South Africa, and the United States, and 25 per cent. cleared in ballast for the West Coast, Buenos Ayres, and Uruguay in search of cargo.

"Mr. Mallet devotes some attention to the progress of railways in the province, and as to the Central Argentine says:—'This line, under the able management of Mr. Henry Fisher, continues to demonstrate its increasing prosperity, as shown by the following table, for which I am indebted to the officers at the administration:—

Year.	No. of Passengers Carried during Year.	No. of Tons of Goods Conveyed during Year.	Receipts from Goods Traffic during Year.	Total Receipts for Year.
1879	71,456	111,496	£139,414	£176,723
1880	70,706	113,317	164,598	230,120
1881	88,578	143,124	181,727	248,098
1882	100,385	181,630	227,233	313,159

"It may be interesting to add here that the tonnage of goods brought from the interior to Rosario station increased from 17,164 in 1872 to 46,540 in 1878, and to 53,661 tons in 1881."

There is one point which should not escape notice in these accounts of the wonderful increase of shipping in the port and of traffic on the railway.

The permanent way materials and rolling stock, &c., for the Andine Railway and the extension beyond Tucuman have had all to be brought through the port of Rosario and either over the whole or a part of the Central Argentine Railway, and as the works for these extensions have been going on very rapidly of late, the traffic would naturally be correspondingly increased, so that this element of prosperity cannot be counted as one of permanent duration, but must cease when the lines referred to are finished. On the other hand, since the extensions of the railway will add materially to the prosperity of the country, the Central Argentine must, as far as it is concerned, reap some benefit from the increased traffic that will naturally flow from the improved condition of affairs.

The Andine Railway starts from the Villa Maria Station on the Central Argentine Railway, at a distance of 140 miles from Rosario. Its first section, from Villa Maria to Rio Cuarto (eighty-two miles), was constructed, during the years 1870-3, for the Argentine Government by Messrs. Jackson & Co. of London, whose representative in the River Plate was the late Mr. Peter Stuart.

The second section—from Rio Cuarto to the Villa Mercedes—is seventy-six miles long; it also belongs to the

Government, for whom Messrs. Rogers and Thomas constructed it.

The country for the whole length of both sections is very level, and the works light; up to this point the general direction of the line is south-west.

At Villa Mercedes the railway turns abruptly towards the north-west, and in fifty-nine miles more reaches the town of San Luis—a total distance of 217 miles from the junction with the Central Argentine line at Villa Maria.

This was all the mileage of the Andine line that was working in the year 1882; but since then another section of it, for about seventy-five miles from San Luis to Las Paz, has been opened, leaving not quite eighty miles more to be finished. In his Message to the Argentine Congress in May last, the President of the Republic gives the assurance that the remainder of the railway to Mendoza will be completed before the beginning of the year 1884. The gauge is 5' 6", the same as that of all the other lines hitherto mentioned. A railway, ninety-six miles long, is projected from Mendoza northwards to San Juan, and it forms part of the system for which Messrs. Clark of Valparaiso hold the concession.

The Tucuman Railway is sometimes called the Great Northern, and also the Central Northern Railway. It begins at the city of Cordoba, the western terminus of the Central Argentine Railway, and extends for 341 miles, in a direction somewhat to the west of north, to the town of Tucuman.

The works were executed for the national Government (in 1872-6) by Messrs. Telfner & Co. as contractors, at a cost of about £4500 per mile.

In this case the ordinary gauge of the country (5' 6") was departed from, and a light line with a narrow gauge of one metre (3' 3 $\frac{1}{2}$ ") was adopted.

This line is of importance from a national point of view, as it gives access to the remote northern provinces of the Confederation. It is at present being extended on towards Jujuy, and a branch towards Santiago is also in process of construction.

The President of the Republic in his Message to Congress of May last, before referred to, says: "The Central Northern Railway yielded, in 1881, 593,018 hard dollars, and in 1882, 819,610, an increase of 226,592 hard dollars. The increase in the goods traffic was 19,000 tons. The line is being relaid, and the rolling stock improved and increased.

"No efforts have been spared to impart vigour to the works on the extension to Salta, and all the necessary materials for carrying them forward have been collected. Very great difficulties were met with just outside Tucuman, owing to the nature of the soil and the scarcity of labour and means of transport; but they have, for the most part, been surmounted, and the works are going on vigorously. On the 1st April the directing engineer had 3200 navvies at work, and during the year 1882, in spite of all the difficulties in the way, over a million cubic metres of earth were removed: and, any extra effort made to finish this railway being as nothing compared with its importance to the country, the Minister of the Interior is now on his way to inspect the works, accompanied by a committee of engineers of recognised capacity. The surveys of this line are completed as far as San José de Metan, and the most convenient route thence to Jujuy is now being considered."

In another paragraph he says:—"The branch to San-

tiago was commenced at the end of last year, and there are 1000 navvies at work on it."

He also refers to projected branches to Rioja and Catamarca, for which the surveys are in progress, and adds, "I hope that you will this year vote the funds necessary to begin the works."

The Eastern Argentine Railway, as originally contemplated, was intended to begin at the town of Concordia in Entre Ríos, and follow approximately the course of the river Uruguay up to Restauracion in the province of Corrientes, opposite to Uruguayana in Brazil—a distance of about 160 miles, and to have a branch of ninety-one miles from Monte Caceres to Mercedes, in Corrientes.

Only a portion of the scheme was carried out, to the extent of ninety-nine miles of the main line along the river, from Concordia to Ceibo Creek.

The line was constructed by the Public Works Company, as contractors for an English company, under a concession with a 7 per cent. guarantee from the National Government.

The first section of thirty-four miles, from Concordia to Federation, was opened in 1874. The country traversed by the upper part of the line is somewhat liable to floods, but the works call for no special remark.

The gauge is the English one of 4' 8½". Its financial career has not been prosperous, as shown by the condition of the net receipts from the working of the line, nor will this cause much surprise to any one who knows the nature of the traffic in the district through which it runs.

The Campana Railway is one of the lines radiating from the city of Buenos Ayres. It is fifty miles long, and extends in a northerly direction to Campana upon the river Parana. The works were begun in 1874 by the contractors, Messrs. Clark & Puchard.

For the first fifteen or sixteen miles no difficulty of construction was met with, but at this point the line, which had hitherto kept to the high land, takes to the low-lying marshy district, and crosses various water-courses subject to heavy floods, and considerable difficulty was encountered in dealing satisfactorily with the engineering problems arising out of this condition of affairs.

At first extensive damage was done to the works by floods, as indeed was more than once the case with all the other low-lying railways in the country, but, from the knowledge derived from this experience, skilful means were adopted to guard against subsequent misfortunes of the kind, and these have since proved thoroughly successful.

For so far the earnings of this line have yielded only very moderate results; but the traffic is increasing, and, should the project for extending it to Rosario, which was one of the measures recently before the Argentine Congress, be carried out, it would give the prospects of this railway a very different aspect.

The Buenos Ayres Northern Railway is nineteen miles long, and runs from the Central Station in the city, on the river bank near the custom-house, out in a northerly direction, as its name implies, to the "Tigre," the starting-place for the steamers going up the river Parana.

It is of the usual gauge of the country (5' 6"), and was

constructed by an English company in 1862-4 under a concession with a seven per cent. guarantee from the Government of the province of Buenos Ayres.

In its short length it has stations at different small towns that used to be the favourite resorts of the wealthier classes among the inhabitants of Buenos Ayres during the summer, and on this account it had, besides the through passengers to and from the Parana steamers, a large local traffic for at least one-half of the year. Tramways have since interfered to some extent with this, as has also the completion of other railways, upon some of which rival places of resort in summer have sprung up, so that the working of the line does not appear from the returns to be nearly so profitable as it was formerly.

The Ensenada Railway is the last on Mr. Mulhall's list of Argentine railways actually open to the public. It was carried out by Messrs. Brassey, Wythes, & Wheelwright, in different sections, from the year 1863 to 1871, without any Government guarantee.

It has the usual 5' 6" gauge, and, with its branches to Barracas and the Boca, measures about thirty-seven miles.

"Its city terminus is at the Central Station, near the custom-house, where it is in direct communication with the Great Southern, Northern, and Western Railways. On leaving the station it enters upon a long viaduct of wrought-iron superstructure for single way, supported by cast-iron screw piles, and laid with a considerable incline falling from the station. By this means the railway descends to the low-lying level of the land about the Boca and Barracas, a couple of miles distant from Buenos Ayres.

After crossing the Riachuelo the course of the line is

south-eastwards, until it reaches Ensenada, passing the neat little town of Quilmes on the way.

Hitherto the traffic on the line has not been very good, but the new works contemplated at Ensenada cannot fail, if carried out, to give a considerable impetus to the prosperity of this railway.

Ensenada is, as has been said, the site selected whereon to found La Plata, the new capital of the province of Buenos Ayres, and it is here also that the new harbour is to be constructed ; so both these matters, when they open into actual life, must have a most beneficial influence upon this railway.

Besides the railways given in the list, there is a branch line, twenty-six miles long, belonging to the Government of Buenos Ayres, connecting the new capital, La Plata, with the station of Ferrari on the Great Southern Railway.

Another railway has recently been added to the list of actual accomplished facts, at least so far as its first section is concerned. It belongs to the system comprised under the name of the *Western Railway of Santa Fé*, the object of which is to connect some of the colonies of the province with the towns of Rosario and Santa Fé.

The first section of this line (from Rosario to Casilda, the capital of the colony of Candelaria, a distance of forty-two miles) was recently (Nov. 1883) opened with great ceremony by the President of the Republic ; and it is a matter of considerable interest that it was executed by a local joint-stock company, with capital raised in the country, Señor Casado being the *concessionnaire* and moving spirit of the enterprise.

The *Buenos Ayres Standard* says of it:—

“The railway runs from Rosario to the town of Casilda, the capital of the Candelaria colony, a distance of some sixty-eight kilometres, and the entire district which it pierces is so ploughed up and settled on, that it is pretty evident the rails were not laid down a day too soon, and the trade already exists to support the line and pay a handsome dividend to the shareholders. That which we now inaugurate is but the first section of the line, the remaining two sections will carry the line to Venado Tuerto.”

Some years ago the concession for a railway from the town of Santa Fé to the wheat colonies lying west of it was obtained by the late Mr. Henry Zimmermann, who entered into an arrangement with Messrs. Waring Brothers of London (then largely engaged upon railway works in the River Plate), for their staff to do the preliminary engineering of the Santa Fé Colonies line, while waiting for Mr. Zimmermann to obtain from the Government some modifications of his concession, when (if granted) Messrs. Waring Brothers would take over the concession and form a company in England to raise the capital and carry out its objects.

It thus happened that the surveys of the line in question were made, and a considerable amount of the earthworks executed, under the direction of the author, who was at the time Messrs. Waring Brothers' principal engineer and agent in the River Plate. The death of Mr. Zimmermann, however, put a stop to the works, and it would appear as if his concession had lapsed, or possibly it has passed into other hands.

In addition to the foregoing there are some railways of importance now in process of construction which will no doubt ere long be added to the list of those in actual opera-

tion. The principal of these has been already alluded to as the connecting line from the Western Railway at the town of Mercedes in the province of Buenos Ayres to the Villa Mercedes Station on the Andine Railway in the province of San Luis, a distance of about 358 miles, embraced in the concession of Messrs. Clark. This, when finished, will be the most direct route for travellers from Buenos Ayres to Mendoza. The gauge is 5' 6".

The President of the Republic calls this the Trans-andine Railway * (in his Message to the Congress already more than once referred to), and says of it, "The Trans-andine Railway, which starts from Mercedes in the province of Buenos Ayres, and will join the Andine at Mercedes in San Luis, after its course over lovely plains that were not long ago the haunt of the savages, is now being laid down at both ends of the line."

He goes on to speak of other lines, and adds—

"The province of Buenos Ayres has given a great impulse to the extension of its railways, which are spreading out, like rays, to the farthest boundaries of its territory.

"The province of Santa Fé with its own credit and resources has begun two lines—from Rosario and its capital to its numerous wheat colonies.

"Private enterprise, and the desire for works on a large scale which is now apparent, will certainly ere long come to second the efforts of the governments."

This brings us to the consideration of the proposed railway across the Andes by the Uspallata Pass, for which Messrs. Clark obtained a concession in the year

* A prospectus of this line has recently (16 Jan. 1884) been issued in London, the name given to the undertaking being the "Buenos Ayres and Pacific Railway." A section of 46 miles is said to be nearly finished and ready for opening to public traffic.

1874. They have since then made very careful explorations and surveys of the route, and the result would appear from the most recently published documents upon the subject to be as follows:—

Upon leaving Mendoza the proposed line takes a general south-westerly direction for about twenty-three miles, to where it meets and crosses the Rio Mendoza. It then follows the course of this river in all its windings up to the Punta de las Vacas, a little beyond which it enters the gorge where the Inca's Bridge is situated, when the point of departure from the river-valley is reached where the mule-path faces the ascent over the summit. The latest modification of the proposed railway leaves the valley there also and pierces through the top of the main mountain-ridge by a straight tunnel 2959 metres (3236 yards) long at a height, at the boundary line between La Plata and Chili, of 10,568 feet above the level of the sea. Upon emerging into open air at the western mouth of the tunnel, the line descends by the *Valle del Juncalilio* close to the mule-path and passes to the south of the Inca's Lake and near the Ojos del agua thence to the valley of the Juncal, until the Rio Aconcagua is reached, which it follows to the town of Santa Rosa de los Andes, the mountain terminus of the railway from Valparaiso.

The total length of this proposed railway across the Andes from Mendoza to Santa Rosa is about 159 miles, of which 118 are in Argentine territory and forty-one in Chili. The inclinations of the ascent to the summit from the eastern side and the descent into Chili, as far as the same are shown upon the published sections, are given in the following tabulated form:—

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List of gradients, etc. shown upon modified section of Messrs. Clark's proposed railway across the Andes by the Uspallata Pass.

	Average Rise.	Kilos.
From Mendoza to the Rio Mendoza .	About 1 in 90 $\frac{1}{2}$	for 37.000
From mouth of the Rio Mendoza to the Punta de las Vacas	1 in 105	112.000
From Punta de las Vacas to the Puente del Inca	1 in 35 $\frac{1}{2}$	15.600
From Puente del Inca to the Rio de las Cuevas	1 in 40	19.000
From Rio de las Cuevas to the entrance of Summit Tunnel	1 in 35 $\frac{1}{2}$	2.359
From entrance of tunnel to boundary line between Chili and La Plata	1 in 1000	2.959
Total length of Line in Argentine Territory (about 118 miles)		188.918
From boundary line between Chili and La Plata to west entrance of tunnel	Falls about 1 in 59	for 1.450
From mouth of tunnel (Zigzag)	Falls " 1 in 28 $\frac{1}{2}$	1.135
	Level ...	.125
	Falls " 1 in 28 $\frac{1}{2}$	.293
(Zigzag)	Level ...	.125
	Falls " 1 in 28 $\frac{1}{2}$	1.327
(Zigzag)	Level ...	.125
	Falls " 1 in 28 $\frac{1}{2}$	.815
(Zigzag)	Level ...	.125
	Falls " 1 in 28 $\frac{1}{2}$	3.125
Tambillos Station	Level ...	.135
Tambillos Station to Rio Juncal incline, averaging 1 in 5 $\frac{1}{4}$, but steepest part being 1 in 4	Falls " 1 in 5 $\frac{1}{4}$	3.866
At the Rio Juncal	Level ...	.199
From the Rio Juncal to the Falls of the Saldado	Falls " 1 in 27	28.460
From the Falls of Saldado to Santa Rosa	Falls " 1 in 70 $\frac{1}{2}$	24.540
Total length in Chili (about 41 miles)		65.845

Upon the incline between Tambillos and the Rio Juncal, which is nearly $2\frac{1}{4}$ miles long, with an average inclination of 1 in $5\frac{1}{2}$ (the steepest part being 1 in 4), there are five curves; three of these have a radius of 1000 metres, one of 800 metres, and one of 500 metres.

Higher up the mountains, between this and the summit, there are four zigzags or shunts, which are approached by gradients of 1 in $28\frac{1}{2}$.

Another projected railway across the Andes was that by the Planchon Pass, surveyed by the author: this was the original Transandine Railway, a name which the Uspallata project is now sometimes known by.

This railway was to start from Bragado Station upon the western line of Buenos Ayres, and to cross the Pampas direct, and pass over the Andes by the Planchon, and connect with the Southern Railway of Chili at Teno Station.

The following extracts from the author's report upon this railway to the Government of Buenos Ayres contain the principal matters of interest connected with it:—

The total distance from Buenos Ayres to Valparaiso by the proposed route is 1,776 $\frac{1}{2}$ kilos. or 1,103 $\frac{3}{4}$ Eng. m.

Of which there are already con-

structed	514	"	319 $\frac{3}{4}$	"
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Leaving still to be made	1,262 $\frac{1}{2}$	"	784	"
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The total length may be subdivided as follows:—

	Kilometres.
Length of railway already existing in Argentine territory	160
Length of railway yet to be made	1,168
Total in Argentine territory	<u>1,328</u>
Length of railway already existing in Chili	354
Length of railway yet to be made	94 $\frac{1}{2}$
Total in Chili	<u>448$\frac{1}{2}$</u>
Total in both countries	<u>1,776$\frac{1}{2}$</u>
	U

The length of railway still required to be executed, in order to complete the existing system and connect Buenos Ayres with Valparaiso, may be further classified thus:—

1. In Argentine Territory.

A. PAMPAS SECTION.

	Kilometres.
From Chivilcoy to Bragado	51
Bragado to San Rafael	766
	<u>817</u>

B. ANDES SECTION.

From San Rafael to the summit of the Planchon Pass	351
	<u>1,168</u>

2. In Chili.

From the summit of the Planchon Pass to Teno Station on the Santiago and Curico Railway	94½
Total	<u>1,262½</u>

The works necessary for the construction of the Pampas portion of the railway call for no special notice, being of the usual character at first, but becoming gradually heavier as the line approaches the mountains. The gradients are all very easy, and the curves of large radius on this section as far as the survey extended.

The Andes Section, however, deserves careful consideration, for which purpose it may be divided into three categories, according as the works occurring on it come under one or other of the following classifications:—

1. Argentine Territory.

	Kilometres.*
Comparatively light work for	173
Moderately heavy	65
Heavy	113
	<u>351</u>

* 1 kilometre = 0.6214 English miles.

2. *In Chili.*

		Kilometres.
Comparatively light work for	.	31
Moderately heavy	„ „	23½
Heavy	„ „	40
		<hr/> 94½
Total	.	445½

Taking the mountain part in both countries together we have—

		Kilos.
Comparatively light work	.	204
Moderately heavy	„	88½
Heavy	„	153
		<hr/> 445½
Total	.	445½

The works, however, taken as a whole, can by no means be considered unusually heavy, but, on the contrary, are decidedly light for a railway across such a mountain range as the Andes. There are no engineering novelties in the undertaking from first to last.

The three points deserving special attention, as being the only ones that do not come into everyday practice in ordinary railway construction, are the incline and shunts at Las Toscas, on the Chilian side, and the necessity for covering in the more exposed parts of the railway on both sides of the summit, so as to protect the line from snow-storms.

These, however, are difficulties which have already been met with and successfully overcome on existing railways.

The railway over Mont-Cenis and the Pacific line across the Rocky Mountains in North America may be cited as examples where equally heavy falls of snow to anything that may be anticipated on the Andes have to be provided against.

The shunts (or zigzags), too, are not unusual on mountain lines, and they are absolutely necessary here if the ordinary system of locomotive engine be adhered to, there being insufficient room in the gorges where the shunts occur to provide curves of a sufficiently large radius to admit of the rolling stock working round them.

As to the incline at Las Toscas, though heavy, it is short, being only 878 metres in length, and perfectly straight. Its average inclination is 1 in $7\frac{3}{4}$, and it is proposed to work it with a wire rope and stationary engine, in the manner usual in such cases.

With this exception, there is no gradient greater than 1 in 27 on the Chilian side; and 1 in 30 is the maximum on Argentine territory.

A more correct idea of some of the inclinations and level portions among the mountains will be obtained from an examination of the following list:—

LIST OF GRADIENTS, &C., UPON ANDES SECTION.

I. From San Rafael to the Summit of the Planchon Pass.

Level for a distance of . . .		Metres.	Per cent.
Gradients Exceeding	Not Exceeding,	53,232 $\frac{1}{2}$	or 15.17
...	1/500	74,780	21.31
1/500	1/250	17,600	5.01
1/250	1/200	20,400	5.81
1/200	1/150	9,400	2.68
1/150	1/120	34,200	9.74
1/120	1/100	25,300	7.21
1/100	1/ 90	10,700	3.05
1/ 90	1/ 80	7,400	2.11
1/ 80	1/ 70	9,580	2.73
1/ 70	1/ 60	10,406 $\frac{1}{2}$	2.97
1/ 60	1/ 50	18,020	5.13
1/ 50	1/ 40	29,561	8.41
1/ 40	1/ 30	30,420	8.67
		351,000	100.00

*II. From the Summit of the Planchon to Teno Station,
Chili.*

Level for a distance of		Metres.	Per cent.
Gradients Exceeding	Not Exceeding	4,972	or 5.25
...	1/500	1,000	1.05
1/500	1/250	600	0.63
1/250	1/120	15,460	16.63
1/120	1/100	4,460	4.71
1/100	1/ 90	9,800	10.26
1/ 90	1/ 80	14,000	14.80
1/ 80	1/ 70	7,000	7.40
1/ 70	1/ 60	6,835	7.14
1/ 60	1/ 50	2,025	2.14
1/ 50	1/ 40	2,200	2.32
1/ 40	1/ 30	18,800	19.90
...	1/ 27	6,500	6.87
Incline to be worked by			
wire rope			
1/9 360	1	878½	0.90
1/7½ 308½	7½		
1/6 210			
		94,530½	100.00

The minimum curve adopted for the mountain district has a radius of 175 metres or 574 feet (about 8½ chain), while on the plains there is no restriction in this respect and a radius of curvature not practically inferior to a straight line can in every instance be employed.

The amount of tunnelling that will be necessary is much less than might have been expected. There are in all fifteen tunnels on the projected line, of which nine are on the eastern and six on the western side of the Andes.

They are all small and unimportant except one, 980

metres in length, through the summit at the head of the Chinqueco valley. The material to be excavated is in each case rock, more or less solid. The following is a tabular statement of their respective lengths :—

LIST OF TUNNELS.

I. In Argentine Territory.

No. 1 Tunnel	Metres.
length 980	
„ 2 „	„ 34
„ 3 „	„ 34
„ 4 „	„ 75
„ 5 „	„ 200
„ 6 „	„ 50
„ 7 „	„ 50
„ 8 „	„ 55
„ 9 „	„ 50
Total length of tunnelling in Argentine territory	1,528

II. In Chili.

No. 10 Tunnel	Metres.
length 60	
„ 11 „	„ 160
„ 12 „	„ 75
„ 13 „	„ 35
„ 14 „	„ 25
„ 15 „	„ 30
Total length of tunnelling in Chili	385
Total tunnelling in both countries	1,913

There are but two viaducts on the entire railway, both of which occur in Chili.

The principal one is that over the Rio Malo, being 200 metres long and 57 metres high at the deepest part of the valley.

The other is about a kilometre distant from it, higher up. It is sixty metres long; its extreme height being thirty-two metres.

The total number of bridges upon the $465\frac{1}{2}$ kilometres between San Rafael and Teno Stations is sixty-one, of which thirty-eight are on the Argentine side of the summit and twenty-three in Chili.

LIST OF BRIDGES BETWEEN SAN RAFAEL AND TENO.

I. *San Rafael to the Summit of the Planchon Pass (Argentine Territory).*

Bridge of 160 metres waterway over the Rio Diamante at San Rafael.

"	100	"	"	"	Rio Grande,
"	60	"	"	"	Rio Atuel.
"	40	"	"	"	Rio Chico.
"	40	"	"	"	Arroyo Montañas.
"	20	"	"	"	Rio Malargue.
"	20	"	"	"	Rio Potimalal.
"	20	"	"	"	Rio de los Angeles.
"	20	"	"	"	Rio Seguro.
"	20	"	"	"	Rio Yeso.
"	20	"	"	"	Rio Montañas.
"	20	"	"	"	Rio Valenzuela.
2 Bridges	20	"	"	"	Rio Leon.
1 Bridge	12	"	"	"	Rio Mayines Colgadas.
"	12	"	"	"	Arroyo Pintado.
4 Bridges	10	"	"	"	Arroyo Malo.
1 Bridge	10	"	"	"	at kilometre 56.38.
"	10	"	"		over the Rio de Azufre.
"	10	"	"		Rio de los Ciegos.
"	10	"	"		Arroyo Pintado.
4 Bridges	8	"	"		at various parts of the line.
7 "	5	"	"		do.
4 "	4	"	"		

Recapitulation.

							Metres.	
I	Bridge of 160 metres waterway	.	.	.	.	.	= 160
I	 ", 100 "	"	"	.	.	.	= 100	
I	 ", 60 "	"	"	.	.	.	= 60	
2	Bridges 40	"	"	.	.	.	= 80	
8	 ", 20 "	"	"	.	.	.	= 160	
2	 ", 12 "	"	"	.	.	.	= 24	
8	 ", 10 "	"	"	.	.	.	= 80	
4	 ", 8 "	"	"	.	.	.	= 32	
7	 ", 5 "	"	"	.	.	.	= 35	
4	 ", 4 "	"	"	.	.	.	= 16	
<hr/>							<hr/>	
38 bridges in all, with an aggregate waterway of							747	

*II. From the Planchon Pass to Teno Station,
Chili.*

Bridge of 60 metres waterway at kilometre 70.15.

"	40	"	"	over the Rio Pecuante.
"	40	"	"	," Rios Teno and Venado.
"	40	"	"	," Rio Teno.
"	20	"	"	,"
2	Bridges 20	 ",	 ",	at kilometre 23.10 and 22.73.
2	 ", 10	 ",	 ",	over the Rio Vergara.
1	Bridge 10	 ",	 ",	," Rio Pellejitos.
"	10	"	"	," Rio Infernillo.
"	10	"	"	," Rio de las Vacas.
"	10	"	"	," Rio Farias.
"	10	"	"	," Rio Fabio.
"	10	"	"	," Estero Pejeri.
"	5	"	"	," Rio Vergara.
"	5	"	"	," Rio Placetas.
3	Bridges 5	 ",	 ",	at different parts of valleys.
3	 ", 3	 ",	 ",	between kilometres 11 and 14.

Recapitulation.

							Metres.
1	Bridge of 60 metres waterway	.	.	.	.	=	60
3	Bridges 40	„	„	.	.	=	120
3	„ 20	„	„	.	.	=	60
8	„ 10	„	„	.	.	=	80
5	„ 5	„	„	.	.	=	25
3	„ 3	„	„	.	.	=	9
23	Bridges in all, with an aggregate waterway of						354

The culverts required upon the mountain section will be 338 on the east, and 183 on the west side of the summit, making a total of 521, or at the rate of 1.12 per kilometre.

LIST OF CULVERTS.

I. *In Argentine Territory.*

						Number.
1	metre culverts and under	.	.	.	222	
1½	„	„	.	.	.	14
2	„	„	.	.	.	79
3	„	„	.	.	.	21
4	„	„	.	.	.	1
6	„	„	.	.	.	1
						338

II. *In Chili.*

1	metre culverts	.	.	.	.	112
2	„	„	.	.	.	63
3	„	„	.	.	.	8
						183
Total	.	.	.	.		521

As to the gauge to be adopted, I think under any circumstances it should be 5' 6", the same as that of the Western Railway of Buenos Ayres, as far as the Pampas Section extends.

For the mountain part, however, this question must depend upon the decision which may be arrived at as to the system of locomotive engines and permanent way to be employed in surmounting the Planchon Pass.

While on this subject, I may be allowed to say that the gauge is the more important, in my opinion, because I think that the direction of the line should deviate slightly from that laid down by the Government Commission, so as to touch at Mercedes and there connect with the network of railways which must undoubtedly before much time elapses stretch on the one hand to San Luis, Mendoza, and San Juan, and in the other direction to Rio Cuarto and Villa Maria, and there join the line from Rosario to Cordoba; and, as the existing railway between Rosario and Cordoba and that now in process of construction to Rio Cuarto have the common gauge of 5' 6", it is extremely probable that their extensions, at least so far as those to Rio Cuarto, San Luis, and Mendoza are concerned, will have the 5' 6" gauge. It is therefore most desirable that this Pampas railway should also adopt it, so as to have every facility for interchanging traffic with the others mentioned above.

Stone of a moderately good quality for building purposes will be found pretty generally throughout the mountain length, but on the plains bricks will have to be used. I have seen no really good brick-earth, but there will be no great difficulty in obtaining in most places material of this description sufficient for ordinary works.

The only places where limestone occurs on the proposed line are at kilometre 190, on the banks of the Malargue, and again at kilometre 128½, near the junction of the valley of the Chinqueco with that of the Rio Grande.

With regard to timber, it is reported to be plentiful

on a portion of the unsurveyed part of the Pampas, but there is none on any part of the line that I have seen which could be calculated upon for supplying a large number of sleepers.

Character and Peculiarities of the Soil.

For some distance after leaving Bragado the land is of an inferior quality, but farther out it is better, and the Pampas, to the extent our survey reached, may be considered to be generally rich and fertile. There are very few "pajanales," and high Pampas grass only occurs at intervals in isolated clumps.

As the mountains are approached the soil becomes less fertile, being light and sandy with a slight admixture of gravel, of which the substratum is composed; when properly irrigated, however, it can be made to produce fine crops and assume the appearance of luxuriant vegetation. Mendoza and the "Potreros" about San Carlos are good examples of what may be done in this respect.

From San Rafael to the mountains the soil in the open country is of the sandy nature just described, interspersed with rugged portions where sand, gravel, and loose earth cover the surface. There is also a good deal of brushwood in many places.

Along the margins of the rivers and streams there is frequently good grass to be found, but elsewhere it is of an inferior, coarse quality and by no means plentiful.

In the valley of the Rio Grande there are not many places where really good grass can be found, but along its tributaries and those of the Tordillo the grass is much better, and large quantities of sheep and cattle are there fattened during the summer season, being for the most part driven over to Chili as the winter approaches.

At Mendoza these valleys are known as the Poteros of the Cordillera, and are considered wonderfully fertile. The right to graze within them is let from year to year by the Government of Mendoza, the tenants, called "invernadores," being usually inhabitants of Chili.

Some of them remain the whole year round, but few of these were met with, and nearly all the rude habitations that were passed by the surveying party appeared to have been recently deserted, no doubt for the winter months. This was not surprising, considering the lateness of the season when the expedition reached this point.

Along the valley of the Valenzuela the grass is better, but towards its upper end it is very poor, and when the Azufre is reached the soil becomes exceedingly barren and the country desolate, the surface of the ground being covered with minute volcanic scoriae. The hill-sides are totally devoid of vegetation, and only in the vicinity of water is any green thing to be seen.

Upon crossing over into Chili the aspect of the country gradually improves. The valleys are at first exceedingly steep and narrow, but they soon assume a less rugged appearance; trees are seen first in small isolated patches of shrubs, afterwards in greater importance both as to number and size. The fertility of the soil becomes by degrees more pronounced, until, by an easy transition, the rich central valley of Chili is reached.

Minerals.

On the west side of the summit, close to the line selected for the railway, are situated silver and copper mines, and lower down near Cypresses, as also in the valley of the Claro, smelting furnaces have been established.

These indications point with no uncertain hand to the confidence of capitalists in the hidden wealth of the Andes.

On the Argentine side I have heard but of one mine being worked, a copper lode off the Valle Hermoso. I can, however, see no reason to doubt that the eastern slopes conceal treasures of a similar character to those found in Chili, all that is required to develop them being facilities afforded by means of communication with the outer world.

In the valley of the Chinqueco, through which the survey-line passes, a quantity of magnetic iron ore was discovered in the sand washed by the river, indicating rich deposits of this metal in the strata through which the river has cut its way.

There is also a very important deposit situated about midway between the rivers Diamante and Atuel, not far from the base of the mountains. Here a well springing from the side of a high hill discharges large quantities of bituminous matter into the valley below. From it issues also a yellowish fluid resembling diluted petroleum, so that there is every probability that, were means provided for transporting it to a market, a large trade would arise from this source.

The Cerro Payen, to the south, is reported to be exceedingly rich in minerals, but we had no opportunity of judging of the correctness of these rumours.

Comparing the two Transandine projects, the one by the Uspallata Pass and the other by the Planchon, we find, as regards the distance between Buenos Ayres and either Santiago or Valparaiso, that the figures stand approximately thus :—

From Buenos Ayres to Santiago.

	Miles.
1. <i>Vía Mercedes</i> on Western Railway, Mercedes in San Luis, Mendoza, and the Uspallata Pass . . .	812
2. <i>Vía Campana</i> , Rosario, Rio Cuarto, Mercedes in San Luis, and Mendoza	860
3. <i>Vía Bragado</i> , San Rafael, and the Planchon Pass . .	990

From Buenos Ayres to Valparaiso.

1. <i>Vía Mercedes</i> on Western Railway, Mercedes in San Luis, Mendoza, and the Uspallata Pass . . .	856
2. <i>Vía Campana</i> , Rosario, Rio Cuarto, Mercedes, and Mendoza	904
3. <i>Vía Bragado</i> , San Rafael, and the Planchon Pass . .	1,104

Therefore, if the object be to reach either of these places, the distance is much shorter by the Uspallata Pass; on the other hand, the summit tunnel through the Cumbre is 10,568 feet above the sea-level, while the highest point on the Planchon route is only 8225, or 2343 feet lower than the projected Uspallata tunnel.

Again, the only incline beyond the maximum gradient of 1 in 27, for ordinary working upon the Planchon line, is the short straight one of 878½ metres at Las Toscas, with an average inclination of 1 in 7½ (the steepest part of it being 1 in 6). Whereas on the Uspallata project there is an incline 3866 metres long (nearly 2½ miles), with an average slope of 1 in 5½, and part of it is as steep as 1 in 4. There are, moreover, five curves upon this incline.

Another point deserving of notice in connection with the Planchon route is that, although the Andes Section, counting all the way from San Rafael, makes the mountain part appear much longer than by the Uspallata, such is not practically the case, because a considerable

portion of this extra length is along the level land at the foot of the slopes. Thus we have—

53,132	metres level.
74,780	„ with gradients lighter than 1 in 500.
17,000	„ „ from 1 in 500 to 1 in 250.
20,400	„ „ „ 1 in 250 to 1 in 200.
<hr/>	
165,312	

So it is evident that upwards of 165 kilometres of the Andes Section is not in reality of a class corresponding to usual mountain-work.

The tunnelling also is much lighter on the Planchon route than on the other line, as the total length is 1913 lineal metres, distributed over fifteen short tunnels; while the Cumbre tunnel alone is 2959 metres.

There are not sufficient data with regard to bridges and viaducts to admit of a comparison being made upon these points.

The position of these two projects may, therefore, I think, be fairly stated in a few words as follows:—

The Uspallata line is much shorter than its rival, and has the advantage of going by the established line of traffic, and touching at Mendoza, where it would reap the benefit of the traffic from San Juan and the neighbouring provinces to the north.

On the other hand, the line by the Planchon crosses the summit at a much lower level, and with less abrupt and shorter incline, and it would be less expensive to construct and work; but it traverses a country as yet unsettled.

While reporting, in the foregoing pages, all this progress in the establishment of railways, I must mention the demise of a line, some six miles long, from Gualeguay

to Port Ruiz in Entre Ríos, as it has long since ceased to work.*

There was a project, that of the "Great Buenos Ayres and Rosario Railway," the works of which were begun some years ago, but no section of it was ever finished.

I have now, I think, given all the useful particulars connected with the railway system of the Argentine Confederation so far as concerns the various lines in operation or under construction, and also of the projects for crossing the Andes not yet quite so far advanced; but, as to noticing in detail, or even giving the names of, the various other lines which promoters are anxious to establish, or those for which concessions may have been granted, it would occupy far more space than can be spared for the purpose. I must therefore confine myself to a few concluding observations upon the general principles which, in my opinion, should regulate the granting of concessions and the terms to be attached to them.

The great prosperity of some of the most important Argentine railways has brought them of late years a good deal under the notice of investors, who, if they could make quite certain of being able to discriminate as to the real merits of the projects laid before them, would not hesitate to place their capital in the better class of South American railway securities.

On the other hand, to obtain a concession, no matter of what kind or on what terms, is looked upon by so many persons as a sure and easy way to make money, that the Government of the day is importuned in all directions to grant concessions to its friends and supporters.

With this precious philosopher's stone (that is to turn

* Latest accounts from the River Plate refer to this railway as if now working.

everything into gold) in his pocket, the *concessionaire* rushes over to London, but does not always find a ready market for what he has to sell. If unsuccessful at first, as is usually the case, he then hawks his concession about the City and Westminster till the document and its owner become familiar objects in these localities—a circumstance which does not tend to raise, but to lower, the credit of similar enterprises, no matter how important, in the country whose offers and pledges are thus forced upon the notice of an unwilling public.

After some unpleasant experience of this nature, when the *concessionaire* has become less fastidious and more importunate, it may happen that he falls in with a more than usually sanguine financial agent, who takes the matter up, but finds upon examination that the conditions of the concession are not such as are likely to induce the public to invest in the undertaking.

Numerous alterations are suggested, and the *concessionaire* is forced to return home to try and induce the Government to modify the terms of his contract in the way suggested.

And here we will leave him in the midst of his troublesome negotiations.

To my mind, the proper course for such a Government as that of the Argentine Republic to follow would be, to lay down for itself certain fixed rules for its own guidance in the matter. For example:—

1. To grant no railway concessions except for such lines as were likely, after a few years' working, to pay a fair dividend upon the capital employed in their construction.

2. Such lines as were not likely to have a good traffic at once, but which might be desirable for strategical purposes, or to open up the country, the Government to construct itself.

3. All the terms which are usually found to be necessary in concessions to be carefully and deliberately considered beforehand, not in the haste of the moment, and inserted in all original concessions.

4. The guarantee to be *absolute* upon the capital, that is to say, that the shareholder should be sure to get the exact amount of interest specified in the concession, no matter what the working expenses of the railway were.

Strict attention to these points would weed out a number of the valueless concessions, which only throw discredit on the really good ones, and prevent the public being so ready to take the latter up.

As a general rule, it would not be very difficult for any person well acquainted with the country to decide, upon broad principles, which are the lines likely before long to yield profitable returns. They should not only traverse a well-settled country, but they must tend in the natural direction of the traffic towards some important town or port. It would be quite possible to construct a railway at right angles to the natural line of traffic of the well-settled districts through which the Buenos Ayres Great Southern or Western Railways run, and for such a line not to pay even its working expenses, while from the very same districts these two lines drew large profits. In all railway projects there are two things to be considered—first, the local traffic, depending upon the most direct means by which passengers can travel, and the produce of the district be conveyed to the best market, which, in the case of wool, hides, and tallow, the staples of Estancia produce in La Plata, is generally the nearest port; and, secondly, the through traffic of passengers and goods from other districts beyond the limits of the line itself.

A railway that does not offer the most favourable con-

ditions in respect of both these matters should at once be rejected from the first category of guaranteed railways.

The next point to which attention should be directed is that of the desirability of constructing railways which, although they may not be likely to earn a fair dividend upon their capital at first, may, nevertheless, be very advantageous for the State, either as tending to develop its resources, or as affording facilities for strategical movements, from which a considerable amount of indirect benefit may accrue.

As an example of a railway that would combine both these interests, I may be allowed to suggest the construction of a line from Bahia-Blanca westwards, say, 200 miles long, to the bend upon the Rio Negro—the new Indian boundary-line. This would form the first section of a frontier railway to follow, from that point onwards, the general course of the Rio Negro as far as the Andes, the summit of which it would pass by Nahuel-huapi at the wonderfully low level of 2756 feet above the sea, or between one-fourth and one-fifth of the height of the Uspallata Pass. The total length of this line from ocean to ocean, not straight across, but following the course of the Rio Negro from the point at which it is first reached, would be about 750 miles from the port of Bahia-Blanca on the Atlantic, to Valdivia on the Pacific, which is the best port in Chili both for its extent and the safety of its anchorage. It is situated at some little distance from the sea on a river of the same name. The soil in the neighbourhood is very fertile, and the hill-slopes are clothed with fine timber.

Valdivia under the Spaniards grew and prospered, and was one of the most thriving Spanish towns in Chili and strongly fortified; but when the original settlers were

driven out, its importance ended, though its natural advantages still survive; and that it will yet be an ocean terminus of one of the great trans-continental routes requires the clothing of no prophet's mantle to enable one to foretell. The first section of the line I have suggested would enable the Government to keep a firm grasp upon this important part of the new frontier, while the railway would ultimately find its way to the magnificent inland sea of Nahuel-huapi along the pleasant orchard-slopes of Manzanas, which Captain Musters visited when "at home with the Patagonians," there to be met by the line from the Chilian side; and it can scarcely be doubted that upon these slopes and the shores of Nahuel-huapi would spring up a colony, or rather a series of towns and colonies, which, by comparison, would dwarf all the existing colonies of La Plata, flourishing though they be.

With this frontier railway established, a settlement would soon be formed all along it, and Indian invasions cease, and fade into historic reminiscences, and then a glorious era would begin for the Argentine Republic, over whose fertile plains the bone and sinew of the over-populated states of Europe would soon spread out in amazing numbers, unchecked by the dread of an unprotected frontier.

That a future such as I have depicted is in store for La Plata I fully believe, but whether it is to come in our day or postpone its advent till our descendants have replaced us, depends upon whether a master-mind can realise the position of affairs at present, and, seizing the outstretched hand of Fortune, force from it the gift concealed therein, till the fickle goddess can ascertain whether the intended recipient is worthy of her favours or not.

Upon the next point, that of modified concessions,

they are never so clear or satisfactory as those in which the conditions are fairly expressed in the first instance ; and, lastly, the question of guaranteed interest is one of the utmost importance, for there is scarcely anything which has been, and apparently will continue to be, more frequently misunderstood by the general run of shareholders than this vexed question.

An intending investor sees a flourishing prospectus, in which it is stated, in large type, that 7 per cent. interest upon the capital has been guaranteed by the Government during the period for which the concession is granted ; and he may further see, in not quite so large type, it is true, that for the purposes of the guarantee the working expenses shall be taken at, say, 50 per cent. of the gross receipts. The conclusion the investor arrives at is probably this : that, the working expenses having been fixed at a fair rate, there can be no dispute upon this head, and therefore he is certain to receive his full 7 per cent. dividend ; but, so far from this following as a matter of course, the result may be very different from what is expected.

To make this point clearer, I will assume a not improbable case. Suppose a very easily constructed railway, not costing more than £5000 a mile, upon which rate there is a 7 per cent. guarantee ; and, further, assuming that it served a thinly populated district, yielding at first gross receipts amounting to, say, only £5 per mile per week, or £260 per mile per annum. Under such conditions the working expenses might easily absorb the whole of the gross receipts, and at the close of the year, when the amount due by the Government on account of the 7 per cent. guarantee came to be made up, it would stand thus per mile :—

7 per cent. on £5000	· · · ·	= £350
Deduct 50 per cent. of gross receipts, £ $\frac{250}{3}$ as		
assumed profit (the other half only being allowed for working expense) · · ·		130
Balance to be made up by Government · · ·		£220

So that the available funds, after the Government had discharged all its obligations, would not be sufficient to pay quite $4\frac{1}{2}$ per cent. dividend, instead of the 7 per cent. guaranteed, and expected by the shareholder, who would no doubt consider himself very badly treated under the circumstances.

Nor are the assumptions here made by any means improbable; for the Lobos branch of the Buenos Ayres Western Railway, $42\frac{1}{2}$ miles in length, is admitted not to have paid its working expenses for some years after it was opened.

Two misapprehensions lie at the bottom of this matter, and they should both be removed.

One is that 50 per cent. of the gross receipts is a fair allowance for working expenses of all railways under ordinary circumstances; whereas in reality it would only suit, under the most favourable conditions, for a line with first-rate traffic, after it has been opened for some time, and when its cost of maintenance has become normal. But on a line with poor or middling traffic the working expenses are likely to be much nearer 100 per cent. than 50.

The other point requiring correction is the erroneous supposition that such a 7 per cent. guarantee is in reality what in words it professes to be; the simple fact being that it is merely a guarantee of 7 per cent. less the percentage, whatever it may be, by which the working expenses exceed 50 per cent. of the gross receipts.

It must not, however, be supposed that to omit the clause fixing the working expenses at a percentage of the gross receipts (for the purpose of calculating the amount payable under the guarantee) would be a satisfactory solution of the difficulty. On the contrary, it would aggravate the evil ; as in that case disputes would perpetually arise, at the Government audit of the railway accounts, as to what charges should, and what should not, be entered under working expenses.

Bearing all these matters in mind, it would seem to be a much more desirable arrangement for the convenience of the shareholders and the credit of the Government that the guarantee should be absolute, the shareholder never to receive less than the promised rate, while the interests of the Government should be guarded by a proper supervision of the receipts and expenditure, and repayment when the net receipts exceed the stipulated minimum.

III.

LIST OF THE STAFF AND OF THE WORKMEN AND OTHERS
 EMPLOYED UPON THE TRANSANDINE EXPEDITION OF
 1871-2.

Robert Crawford, Engineer-in-Chief.

I. Pampas Party.

R. C. Clitherow, Assistant Engineer.
 C. S. Cochrane, do.
 C. F. Gripper, do.
 J. T. Jarvis, do.
 G. M'Lellan, do.
 A. H. Rowan, do.
 J. Creaghe, M.D., Medical Officer to the Expedition.
 Captain Cabrera, Officer in charge of Transport Service.
 P. Bookey, Government Commissary.
 — Antonolfi, Assistant do.
 J. McTiernan, Interpreter.
 F. Mux, Second Interpreter and Storekeeper.
 François Deschoux, Cook.

Chainmen, Staffholders, and Workmen, &c.

— Barnes.	J. W. Galwey.
V. Brauberger.	William Henderson.
Walter Brown.	James Hodge.
Martin Burk.	Jonas Jenkins.
John Cameron.	Thomas Jenkins.
E. Cram.	Alfred Jones.
R. S. Dills.	— Lange.
G. Edwards.	William Linton.
W. Evans.	— Macrae.
Martin Galvin.	Donald MacDonald.

John MacDonald.	T. Nugent.
John MacVariah.	George Pearse.
James Maguire.	William Proctor.
Cæsar Meissner.	Ed. Robinson.
E. R. Morse.	Charles Ryberg.
D. Mulligan.	Alfred St. Clare.
George Murray.	James Wilson.

2. *Chilian Party.*

E. R. Dymoke, Engineer in Charge.
 David Gravell, Assistant Engineer.
 T. Kemp, do.

3. *Stationed at Buenos Ayres.*

Thomas Logan, Assistant Engineer and Draughtsman.

Prior to R. Crawford's appointment, the Chilian party had been sent out under Mr. C. Chapman to examine and survey the proposed line up the western slopes; but the snow falling heavily, they were unable to complete the surveys to the summit, and returned to England. Mr. Chapman went out again to Chili for a short time the following season, to see the survey started and everything put into working order, and when this was done he handed over charge to Mr. Dymoke, who from that out directed the Chilian surveying party.

Mr. Gripper was engaged upon the survey on the Chilian side of the Andes during the time the first exploring party spent there, but the next season he joined the Pampas party and remained with them until Mendoza was reached, when he was obliged to return to England on private business.

Mr. Kemp, when the Chilian party finished their surveys, joined the Pampas staff, and worked with them

down the valley of the Rio Grande and to San Rafael, returning from thence to Buenos Ayres with the rest of the party.

Mr. Jarvis took charge of the Pampas party, after R. Crawford left it, down the Rio Grande to Fort San Rafael, and back to Buenos Ayres when the surveys were discontinued.

The bullock-drivers, &c., are not given in the list of workmen, as I have no memorandum of their names. Their time was kept, and they were engaged and paid, by the Government commissary, and I have no return of his with any information concerning them. Nor have I any list of the workmen of the Chilian party.

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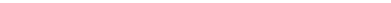
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THE END.

MAP
SHOWING THE ROUTE
OF THE
NSANDINE RAILWAY
EXPLORING
AND
SURVEYING EXPEDITION
OF
1871-2.

Scale.

0	10	20	30	40	50	60	70	80	90	100	English Miles
											

*ROBERT CRAWFORD, MA.,
Engineer-in-Chief of the Expedition.*

REFERENCE.

continuous red line shows the route travelled. (thus) _____

black line indicates Railways now (Nov 1883) working. —

black line, Railways in process of construction. - - - - -

56 55 54 west of Greenwich. 20

Ballantyne, Hanson & C° Edinburgh & London.

